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ABSTRACT

During the past century, one distinctive effort to improve science and mathematics education is an approach that recognizes the commonalities between science and mathematics and seeks to appropriately and effectively integrate these two disciplines in teaching and learning. Philosophically and theoretically, there is strong support for the integration of science and mathematics education as a way to enrich science and mathematics learning experiences and improve student understanding of and attitude toward these disciplines. This bibliography was prepared for classroom teachers, teacher educators, curriculum reformers and developers, and educational researchers interested in the exploration of the topic of integrated science and mathematics teaching and learning. The first volume of the bibliography contained 555 citations published between 1905 and the first half of 1991 related to the integration of science and mathematics teaching and learning. This volume is an updated bibliography of publications from the second half of 1991 through 2001 and includes documents that were inadvertently omitted in the first volume. The major purposes of both volumes are to: (1) provide resources for classroom practice, policy decisions, and research; (2) facilitate the development of new curriculum and instructional materials; (3) stimulate additional research; (4) identify K-12 and teacher preparation and enhancement models; and (5) present a century-long portrayal of trends and issues. (MVL)

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School Science and Mathematics Association
Topics for Teachers Series Number 7

A BIBLIOGRAPHY OF INTEGRATED SCIENCE AND MATHEMATICS TEACHING AND LEARNING LITERATURE

Volume 2: 1991-2001

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By

Donna F. Berlin

Hyonyong Lee

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INTEGRATING SCIENCE AND MATHEMATICS EDUCATION: HISTORICAL ANALYSIS

Introduction

During the past century, one distinctive effort to improve science and mathematics education is an approach that recognizes the commonalities between science and mathematics and seeks to appropriately and effectively integrate these two disciplines in teaching and learning (Berlin & White, 1998; Lee, 2000; Pang & Good, 2000). A number of national science and mathematics education professional associations, and recently technology education associations, are united in their support for the integration of science and mathematics teaching and learning. The national education reform documents published by the following associations recommend the integration of science and mathematics education: American Association for the Advancement of Science (1989, 1993, 1998); International Technology Education Association (1996, 2000); National Council of Teachers of Mathematics (1989, 1991, 1995, 2000); National Research Council (1989, 1990, 1996); National Science Teachers Association (1992, 1997).

The following excerpts from national educational reform documents attest to the significance and timeliness of this compilation of the literature related to integrated science and mathematics teaching and learning. These documents address the interrelated nature of science and mathematics along with implications for curricula and instructional practice.

Benchmarks for Science Literacy (American Association for the Advancement of Science, 1993) while recognizing the uniqueness of each discipline, suggests a symbiotic relationship between science, mathematics, and technology.

> It is the union of science, mathematics, and technology that forms the scientific endeavor and that makes it so successful. Although each of these human enterprises has a character and history of its own, each is dependent on and reinforces the others. (p. 3)

A similar position is reflected in the Connections Standard promoted by the mathematics education community. Opportunities for students to recognize and apply mathematics in contexts outside of mathematics are central to this process standard.

> School mathematics experiences at all levels should include opportunities to learn about mathematics by working on problems arising in contexts outside of mathematics. These connections can be to other subject areas and disciplines as well as to students' daily lives. (p. 65)

The current national science and mathematics standards that guide both state curriculum frameworks and local courses of study affirm the importance of the integration of science and mathematics education.

> The science program should be coordinated with the mathematics program to enhance student use and understanding of mathematics in the study of science and to improve student understanding of mathematics. (National Research Council, 1996, p. 214)

> The opportunity for students to experience mathematics in a context is important. Mathematics is used in science, the social sciences, medicine, and commerce. The link between mathematics and science is not only through content but also through process. The processes and content of science can inspire an approach to solving problems that applies to the study of mathematics. (National Council of Teachers of Mathematics, 2000, p. 66)

Philosophically and theoretically there is strong support for the integration of science and mathematics education as a way to enrich science and mathematics learning experiences and improve student understanding of and attitude toward these disciplines. This bibliography has been prepared for classroom teachers, teacher educators, curriculum reformers and developers, and educational researchers interested in the exploration of the topic of integrated science and mathematics teaching and learning.

Purpose

As identified in the first volume of the bibliography (Berlin, 1991), there were 555 citations published between 1905 and the first half of 1991 that relate to the integration of science and mathematics teaching and learning. This is an updated bibliography (Volume 2) of publications from the second half of 1991 through 2001, including documents that were inadvertently omitted in the first volume of the bibliography.

The major purposes of both the first and second volumes of the bibliography of integrated science and mathematics teaching and learning literature are to:

1. provide resources for classroom practice, policy decisions, and research;
2. facilitate the development of new curriculum and instructional materials;
3. stimulate additional research;
4. identify K-12 and teacher preparation and enhancement models; and
5. present a century-long portrayal of trends and issues.

Method

As a first step to compile the bibliography, relevant journals were identified using the Current Index to Journals in Education (CIJE) provided by the Educational Resources Information Center (ERIC). ERIC indexes more than 1,100 journals, including science and mathematics education journals published throughout the world. Science, mathematics, and technology education journals covered by CIJE and ERIC Documents (see Appendix for a listing of relevant journals) were examined. As a second step, after all articles related to the integration of science and mathematics education were selected,

a content analysis was used to determine the major theme and content of each article. The authors read all selected articles repeatedly and used a process of dialogue and consensus to ultimately place each article in one of the five sections of the bibliography. As a final step, all articles were subjected to another review with regard to section classification.

For consistency, this second volume of the bibliography of integrated science and mathematics teaching and learning literature used the same process of analysis and delineation of sections as employed in the first volume by Berlin (1991). This second bibliography of integrated science and mathematics teaching and learning literature has been divided into five sections: (1) Curriculum [C], (2) Instruction [I], (3) Research [R], (4) Curriculum-Instruction [C-I], and (5) Curriculum-Evaluation [C-E]. It should be noted that articles in each of the five sections with their publication year followed by a lower case letter refer to citations by the same author with the same publication date appearing in the alphabetic listing of the bibliography.

A narrow definition of curriculum has been used. Curriculum relates to intended learning or the outcomes of being educated. Citations in the Curriculum Section primarily deal with the content in a course or group of courses or simply put "what students are taught". Instruction is the process of implementing the curriculum. It refers to the structuring of the learning environment to coordinate elements of time, space, materials, equipment, and personnel. Simply put, citations in the Instruction Section primarily relate to "how students are taught". While it is recognized that the instruction literature must initially deal with the curriculum, those documents that have been placed in this category primarily deal with the instructional elements. The Research Section includes both theoretical and empirical research documents. The theoretical research documents are comprised of theoretical models and frameworks related to the integration of science and mathematics teaching and learning. Empirical research includes research documents that are data based and generate new knowledge and understandings from both qualitative and quantitative inquiry. Empirical research also includes reviews of research. Two sections were used in order to classify curriculum programs that include instructional activities (Curriculum-Instruction Section) and evaluation of curriculum programs (Curriculum-Evaluation Section). It should be noted that while most of the citations can be distinctly placed in one of the bibliography sections, there are some that cannot and placement decisions were based upon the primary focus of the document.

Analysis and Discussion

The topic of integrated science and mathematics teaching and learning is not new. The earliest document referenced in the first bibliography of integrated science and mathematics teaching and learning literature was published in 1905 in *School Science and Mathematics*. At the turn of the 20th century, numerous articles appeared in this same journal published by the Central Association of Science and Mathematics Teachers (CASMT). In 1970, this association was renamed the School Science and Mathematics Association (SSMA) and their journal, *School Science and Mathematics*, continues to be a principal source for integrated science and mathematics articles. National funding agencies have also been involved in integration efforts.

A cursory look at both the first and second volumes of the bibliography of integrated science and mathematics teaching and learning literature reveals that there

continues to be a plethora of terms being used to refer to "integration"; e.g., connections, cooperation, coordinated, correlated, cross-disciplinary, fused, interactions, interdependent, interdisciplinary, interrelated, linked, multidisciplinary, transdisciplinary, and unified. These terms represent various degrees of integration including mathematics taught as a prerequisite tool for science, mathematics applied to science problems, science phenomena translated into mathematical terms, and science and mathematics taught in concert in a real-world, problem-solving context.

Overview of the Bibliography (Volume 2)

The second volume of the bibliography of integrated science and mathematics teaching and learning literature includes a total of 402 documents. A comparison of the separate sections of the bibliography indicates that the documents related to instruction permeate the literature. Specifically, there are 255 documents in the Instruction Section as compared to 40 in the Curriculum Section, 83 in the Research Section, 20 in the Curriculum-Instruction Section, and 4 in the Curriculum-Evaluation Section. Table 1 provides the totals for each of the five sections along with the number of articles by year, 1991 to 2001, for each section.

Table 1

Integrated Science and Mathematics Teaching and Learning Literature by Section and Year (Volume 2)

Year	Curriculum	Instruction	Research	Curriculum-Instruction	Curriculum-Evaluation	Total
1991	8	10	8	1	1	28
1992	5	14	8	2	0	29
1993	8	43	7	5	1	64
1994	8	46	7	4	1	66
1995	1	23	8	1	1	34
1996	2	21	1	3	0	27
1997	1	23	7	1	0	32
1998	2	20	16	0	0	38
1999	0	17	6	1	0	24
2000	3	25	7	1	0	36
2001	2	13	8	1	0	24
Total	40	255	83	20	4	402

Many of the documents in the Curriculum Section describe courses, projects, or programs designed to integrate science and mathematics at a variety of levels, K-16. In addition, teacher education integrated science and mathematics courses, projects, or programs for both pre-service and in-service teachers are cited in this section. The addition of teacher education programs designed to prepare teachers to integrate science and mathematics education is any interesting trend unique to the second bibliography.

As in the first bibliography, the greatest number of citations appears in the Instruction Section (n = 255). The science concepts and processes and mathematics concepts and skills that emerged in the analysis of the instructional documents in the first bibliography were also apparent in the second bibliography. The science processes of classifying, collecting and organizing data, communicating, controlling variables, developing models, experimenting, inferring, interpreting data, measuring, observing, predicting, and space-time relationships were most frequently cited in the instruction literature. The most frequent mathematics concepts/skills mentioned or implied include: angular measurement, estimation, formulas and equations, fractions, function, geometry, graphs, modeling, patterns, percentage, probability and statistics, problem solving, ratio and proportion, and variable. Analysis of this literature reveals that most of the documents are basically science instructional activities or lessons for middle and secondary school students that include mathematics-related concepts. During the years 1993 and 1994, there was a noticeable increase in the number of integrated science and mathematics instructional documents. Perhaps, the numerous meetings and preliminary documents related to the development of the national standards for science education along with implementation of the national standards for mathematics education encouraged individuals to explore instructional connections between these two disciplines.

Update of the Bibliography (Volume 1)

The first volume of the bibliography of integrated science and mathematics teaching and learning literature (Berlin, 1991) identifies 555 relevant documents published between 1905 and 1991, a period of 87 years. Thirteen subsequent citations were identified for this period of time resulting in a revised total of 568. Table 2 displays the integrated science and mathematics teaching and learning literature by section and by year as reported in the first bibliography (Berlin, 1991) plus omissions identified during the compilation of this second volume of the bibliography.

Table 2

Integrated Science and Mathematics Teaching and Learning Literature by Section and Year (Volume 1, Berlin, 1991) Plus Omissions (Volume 2, Berlin & Lee, 2003)

Year	Curriculum	Instruction	Research	Curriculum-Instruction	Curriculum-Evaluation	Total
1905	2					2
1926	1					1
1929	1					1
1930	1					1
1931	1					1
1935	1					1
1936	1					1
1937	1					1
1939	1					1
1941	1					1
1942		2				2
1943			1			1
1945	1					1
1950		1				1
1952	1					1
1957		2				2
1958	1					1
1959	1		1		1	3
1961	4	1				5
1962	3	1				4
1963	1	1	1	1		4
1964				1		1
1965	1					1
1966	3		1			4
1967			1	1		2
1968		1		2	1	4
1969	0 (+1)	1	1	2		4 (+1)
1970	2	2		3		7
1971	1	5	1	29		36
1972	4	5		5		14
1973	1	3	1	2		7
1974	2	3		2		7
1975	10	11		4	3	28
1976	1	3	2	15	2	23
1977		3	3	27	2	35
1978	2	3	1	3	1	10
1979	4	16				20
1980	2	6		5		13
1981	2	5	2	1 (+1)		10 (+1)
1982		6		1		7
1983	2	4 (+1)	2	2		10 (+1)
1984	1	3	7	2		13
1985	2	19	4 (+1)	6		31 (+1)
1986	4	11	3	12		30
1987	5	39	2 (+2)	24	1	71 (+2)
1988	4	19 (+1)	2 (+1)	5		30 (+2)
1989	3	42	3 (+1)	3		51 (+1)
1990	5	28 (+3)	1 (+1)	5		39 (+4)
1991		5	1	3	2	11
Total	84 (+1)	251 (+5)	41 (+6)	166 (+1)	13	555 (+13)

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Comparison of the Bibliography (Volumes 1 and 2)

In 1992, the Department of Education funded the Eisenhower National Clearinghouse (ENC) to develop a database of all K-12 mathematics and science resources. A recent search of the ENC database resulted in the identification of 1,165 integrated science and mathematics curriculum-instruction resources. Consequently, the second bibliography does not include the vast number of integrated curriculum-instruction resources now available in the ENC database.

Table 3

Adjustment of the Integrated Science and Mathematics Teaching and Learning Literature for the Curriculum-Instruction Section by Year (Volume 1, Berlin, 1991)

Year	Curriculum-Instruction	Curriculum-Instruction Programs	Total
1905 - 1962			
1963	1	(-1)	0
1964	1		1
1965			
1966			
1967	1		1
1968	2		2
1969	2		2
1970	3		3
1971	29	(-28)	1
1972	5	(-1)	4
1973	2		2
1974	2	(-1)	1
1975	4		4
1976	15	(-11)	4
1977	27	(-27)	0
1978	3		3
1979			
1980	5	(-2)	3
1981	1 (+1)		1
1982	1		1
1983	2	(-2)	0
1984	2		2
1985	6	(-1)	5
1986	12	(-10)	2
1987	24	(-22)	2
1988	5	(-5)	0
1989	3	(-2)	1
1990	5	(-4)	1
1991	3	(-3)	0
Total	166 (+1)	(-120)	47

In order to compare the first bibliography to the second bibliography, it is necessary to modify the numbers reported in the Curriculum-Instruction Section of the first bibliography. The first bibliography includes a substantial number of curriculum-instructional programs (e.g., Activities Integrating Mathematics and Science and Great Explorations in Math and Science) designed as total programs or as supplements to the

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established curricula. These programs and their corresponding documents/books were included in the first bibliography because, at the time, there was no other cataloging of these resources.

To make a valid comparison of the first to the second bibliography, the numbers in the first volume of the bibliography have been adjusted to subtract curriculum-instruction resources that are now catalogued by ENC (n = 120) and add the one citation that was previously omitted. (See Table 3.) The adjusted number of citations in the Curriculum-Instruction Section in the first volume of the bibliography is 47. Accordingly, the adjusted total number of citations in the first volume of the bibliography is 448.

Overall, a comparison between the first volume (1905-1991) and the second volume (1991-2001) of the bibliography reveals a dramatic increase in the number of documents related to the integration of science and mathematics teaching and learning. For the years 1905-1991 or for a period of 86.5 years, 448 citations (based on adjusted numbers for the Curriculum-Instruction Section) were identified. In contrast, for the years 1991-2001, a period of only 10.5 years, 402 citations were identified. This is a remarkable statistic, nearly the same number of articles were published in the last 10.5 years as in the preceding 86.5 years.

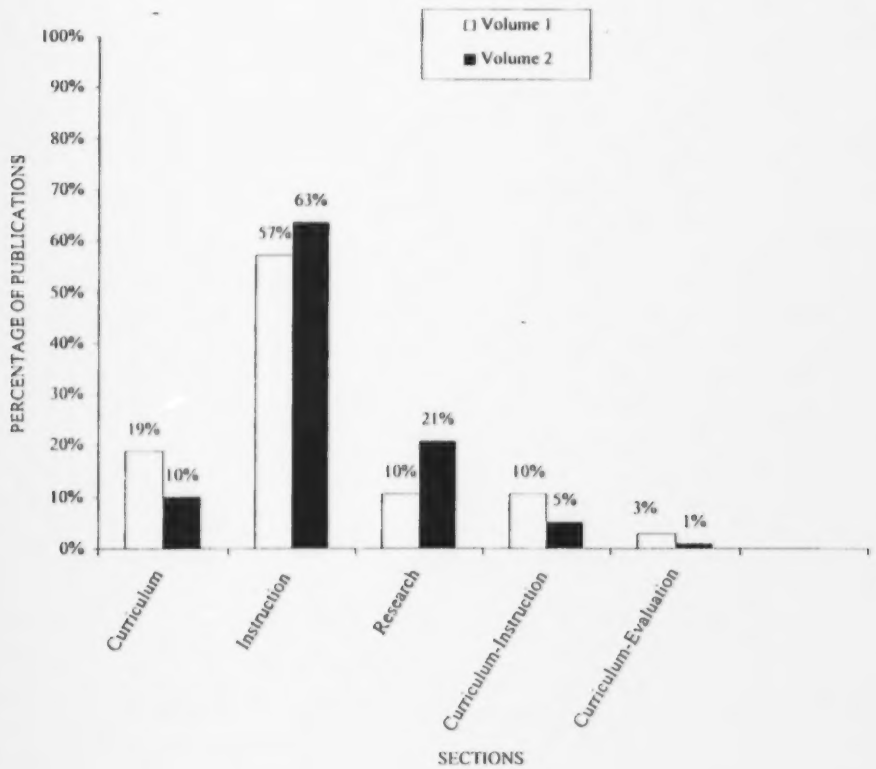

Figure 1. Percentage of publications in the bibliography (Volumes 1 and 2) by section.

Figure 1 illustrates the percentage of documents in each of the five sections in the first volume of the bibliography compared to the second volume of the bibliography. Comparing the Curriculum Section in the first and second volumes of the bibliography indicates that the percentage of articles devoted to curriculum is 19% and 10% respectively. However, as previously noted, the second volume of the bibliography includes many more documents related to teacher education programs for both pre-service and in-service teachers designed to integrate science and mathematics education.

What is rather startling is that the number of instructional documents in the first bibliography covering approximately 87 years is almost the same number as in the second bibliography covering approximately 11 years. However, the percentage of instructional documents in the first bibliography compared to the second bibliography has increased from 57% to 63%. Surprisingly, the largest number of instructional activities published in the last decade focused upon middle school science, secondary mathematics, and secondary science, in decreasing order. Approximately the same number, nearly three times lower than the aforementioned instructional activities, were developed for elementary school mathematics, elementary school science, and middle school mathematics. These grade level distinctions are in stark contrast to those found in the first volume of the bibliography where most of the instructional documents focused upon upper elementary and middle school grades. The attention to integrated instructional activities for secondary mathematics and secondary science classrooms is clearly a dramatic, unanticipated finding in the second volume of the bibliography.

The first volume of the bibliography revealed a profound lack of research documents. Out of the original 448 citations (adjusted number), only 10% relate to research over a period of 86.5 years. In contrast, the second volume of the bibliography of integrated science and mathematics teaching and learning literature identifies 21% of the citations related to research, double the percentage of articles devoted to research in a mere 10.5 years. It should be noted that there was nearly a balance between theoretical and empirical research and that there was considerable attention to the development of theoretical models for the integration of science and mathematics education during the last decade. Similar to the trend noted in the Curriculum Section, theoretical models and empirical research related to integrated science and mathematics courses, projects, and programs for pre-service and in-service teachers have emerged in the last decade. As noted in the first volume of the bibliography, the terminology and definition of integration is not at all consistent within the literature precluding reliable and valid comparisons among research studies. Clearly, there remains a critical need for careful conceptualization and additional research on integrated science and mathematics teaching and learning for all grade levels and teacher education preparation and enhancement programs.

The percentage of documents focused on curriculum-instruction has dropped from 10% (first volume) to 5% (second volume). Although there are many more current integrated curriculum-instruction resources, the percentage of articles describing both curriculum and instruction appears to be diminishing.

A similar diminishing pattern appears in the Curriculum-Evaluation Section comparison. The percentage of articles in this section reported in the first bibliography is 3% and the percentage of articles in the second bibliography is 1%.

The graphical display of all the documents related to the integration of science and mathematics teaching and learning that have been published each decade through 1999 and from 2000 to 2001 yields an impressive and revealing trend. Figure 2 depicts the data.

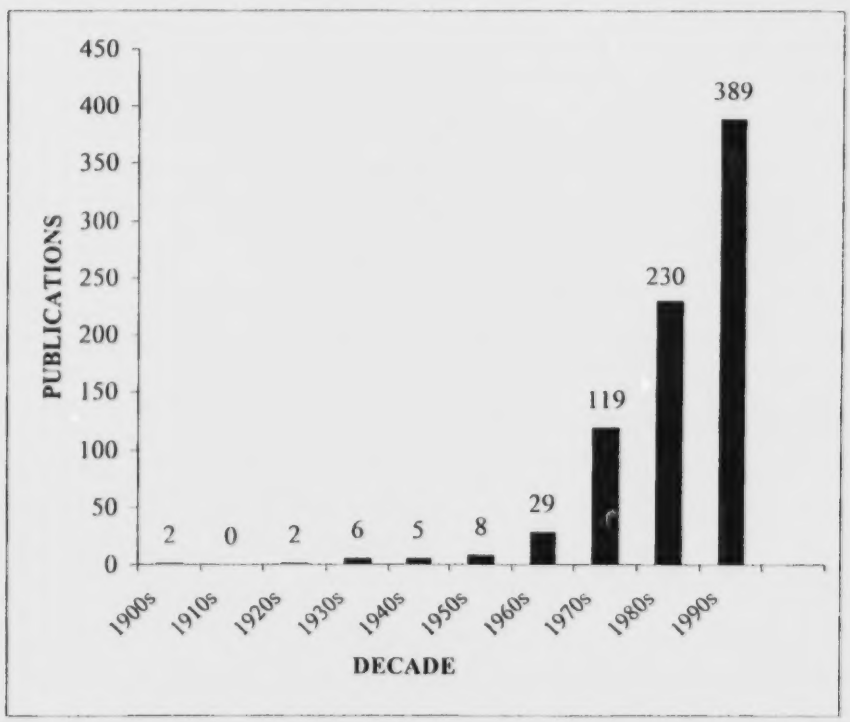

Figure 2. Integration of science and mathematics teaching and learning literature by decade.

The pattern of growth in the number of integrated science and mathematics documents since the 1970s seems to be continuing into the 21st century and may reflect increased federal funding, recommendations from national reform documents, and teacher education programs related to integrated science and mathematics education. Using a line of best fit determined by a regression analysis, approximately 575 documents related to the integration of science and mathematics education is projected for the next decade, 2000-2009. (See Figure 3.)

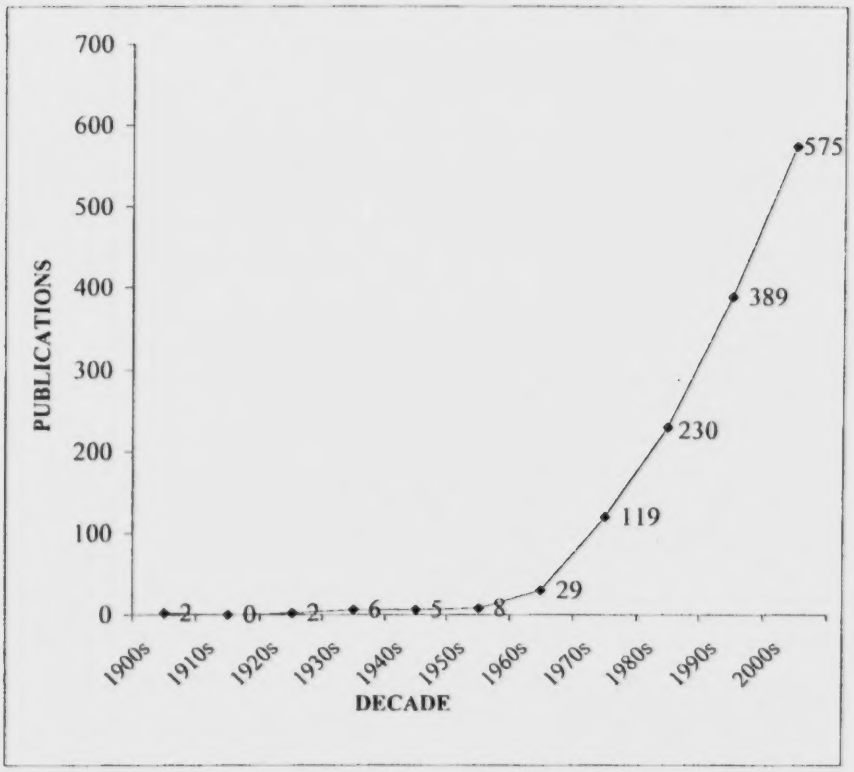

Figure 3. Projected integration of science and mathematics teaching and learning literature by decade.

It is hoped that this bibliography will generate additional dialogue, development, and research in order to gain a better understanding of integrated science and mathematics teaching and learning. These efforts can lead to enriched classroom experiences, promote student engagement in learning, and improve student attitude toward and achievement in both science and mathematics.

Finally, although there are 448 citations (adjusted number) in the first volume of the bibliography and 402 citations in the second volume of the bibliography, this listing is not intended to be exhaustive. The authors apologize to any author whose work in this area has been inadvertently omitted and communication as to any omissions would be appreciated. This bibliography is not intended as a final product, but will be periodically updated.

References

American Association for the Advancement of Science. (1989). *Project 2061. Science for all Americans. Summary.* Washington, DC: Author.

American Association for the Advancement of Science. (1993). *Benchmarks for science literacy.* New York: Oxford University Press.

American Association for the Advancement of Science. (1998). *Blueprints for reform.* New York: Oxford University Press.

Berlin, D. F. (1991). *A bibliography of integrated science and mathematics teaching and learning literature* (School Science and Mathematics Association Topics for Teachers Series Number 6). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

Berlin, D. F., & White, A. L. (1998). Integrated science and mathematics education: Evolution and implications of a theoretical model. In B. J. Fraser & K. G. Tobin (Eds.), *International handbook of science education* (pp. 499-512). Dordrecht, Netherlands: Kluwer Academic Publishers.

International Technology Education Association. (1996). *Technology for all Americans: A rationale and structure for the study of technology.* Reston, VA: Author.

International Technology Education Association. (2000). *Standards for technological literacy: Content for the study of technology.* Reston, VA: Author.

Lee, H. (2000). Integrating science with other subjects. In D. L. Haury & W. S. McCann (Eds.), *Trends in science education research-1998: Taking the annual pulse of the science education research community* (pp. 138-140). Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: Author.

National Council of Teachers of Mathematics. (1991). *Professional standards for teaching mathematics.* Reston, VA: Author.

National Council of Teachers of Mathematics. (1995). *Assessment standards for school mathematics.* Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

National Research Council. (1989). *Everybody counts. A report to the nation on the future of mathematics education.* Washington, DC: National Academy Press.

National Research Council. (1990). *Reshaping school mathematics. A philosophy and framework for curriculum.* Washington, DC: National Academy Press.

National Research Council. (1996). *National science education standards.* Washington, DC: National Academy Press.

National Science Teachers Association. (1992). *Scope, sequence and coordination of secondary school science. Vol. 1. The content core: A guide for curriculum developers.* Washington, DC: Author.

National Science Teachers Association. (1997). *NSTA pathways to the science standards: Guidelines for moving the vision into practice, Elementary school edition.* Arlington, VA: Author.

Pang, J., & Good, R. (2000). A review of the integration of science and mathematics: Implications for further research. *School Science and Mathematics, 100*(2), 73-81.

SECTION 1: CURRICULUM [C] LITERATURE

Aghadiuno, M.C.K. (1992). Mathematics: History, philosophy and applications to science. *International Journal of Mathematical Education in Science and Technology, 23*(5), 683-690.

Barton, R. (1993). Computers and practical science: Why isn't everyone doing it? *School Science Review, 75*(271), 75-80.

Deeds, D. G., Allen, C. S., Callen, B. W., & Wood, M. D. (2001). A new paradigm in integrated math and science courses. *Journal of College Science Teaching, 30*(3), 272-278.

Dunn, J. W., & Barbanel, J. (2000). One model for an integrated math/physics course focusing on electricity and magnetism and related calculus topics. *American Journal of Physics, 68*(8), 749-757.

Else, J. (1993). Structures: A cross-curricular theme. *Mathematics in School, 22*(3), 30-33.

Ferrini-Mundy, J. (1998). Learning from the math standards. *The Science Teacher, 65*(9), 27-29.

Francis, R., & Underhill, R. G. (1996). A procedure for integrating math and science units. *School Science and Mathematics, 96*(3), 114-119.

Gardner, H., & Boix-Mansilla, V. (1994). Teaching for understanding - Within and across the disciplines. *Educational Leadership, 51*(5), 14-18.

Hamm, M. (1992). Achieving scientific literacy through a curriculum connected with mathematics and technology. *School Science and Mathematics, 92*(1), 6-9.

Hammond, M. (1993b). What does cross-curricular mean? *Mathematics in School, 22*(2), 14-15.

Hiatt, E. L., & Covington, J. (Eds.). (1991). *Curriculum.* Austin, TX: Texas Education Agency, Division of Gifted/Talented Education. (ERIC Document Reproduction Service No. ED340163)

Hoffman, K. M., & Stage, E. K. (1993). Science for all: Getting it right for the 21st century. *Educational Leadership, 50*(5), 27-31.

Hurd, P. D. (1991). Why we must transform science education. *Educational Leadership, 49*(2), 33-35.

Isayev, D. A. (1993). A Soviet approach: Integrated science. *Science Scope, 16*(5), 50-55.

BEST COPY AVAILABLE

Jacobs, H. H. (1991). Planning for curriculum integration. *Educational Leadership, 49*(2), 27-28.

Jensen, R. S., Gannaway, S. B., & Sloan, M. P. (1994). *Integrated mathematics and science courses for preservice teachers, K-8 or 4-8.* Washington, DC: Eisenhower Program for Mathematics and Science Education. (ERIC Document Reproduction Service No. ED384520)

Johnson, H. A., & Jett, P. (1993). Making the connection. *Science Scope, 16*(6), 4-6.

Kleiman, G. M. (1991). Mathematics across the curriculum. *Educational Leadership, 49*(2), 48-51.

Kober, N. (1991). How can math instruction be better integrated with the rest of the curriculum? In N. Kober, *EdTalk. What we know about mathematics teaching and learning* (p. 13). Washington, DC: Council for Educational Development and Research.

Kotar, M., Guenter, C. E., Metzger, D., & Overholt, J. L. (1998). Curriculum integration: A teacher education model. *Science and Children, 35*(5), 40-43.

McBride, J. W., & Silverman, F. L. (1991). Integrating elementary/middle school science and mathematics. *School Science and Mathematics, 91*(7), 285-292.

McGehee, J. J. (2001). Developing interdisciplinary units: A strategy based on problem solving. *School Science and Mathematics, 101*(7), 380-389.

Meier, S. L., Hovde, R. L., & Meier, R. L. (1996). Problem solving: Teachers' perceptions, content area models, and interdisciplinary connections. *School Science and Mathematics, 96*(5), 230-237.

Miller, K., Metheny, D., & Davison, D. (1997). Issues in integrating mathematics and science. *Science Educator, 6*(1), 16-21.

Miller, R. (1995, March). A physics/analysis class. *Ohio Journal of School Mathematics, 30*, 1-4.

Mudroch, V. (1992). The future of interdisciplinarity: The case of Swiss universities. *Studies in Higher Education, 17*(1), 43-54.

Nelson, J. R., & Frederick, L. (1994). Can children design curriculum? *Educational Leadership, 51*(5), 71-74.

Oty, K. J., Elliott, B. M., & McArthur, J. M. (2000). An interdisciplinary algebra/science course. *Primus, 10*(1), 29-41.

Palmer, J. M. (1991). Planning wheels turn curriculum around. *Educational Leadership, 49*(2), 57-60.

Petrie, H. G. (1992). Interdisciplinary education: Are we faced with insurmountable opportunities? In G. Grant (Ed.), *Review of research in education*. Washington, DC: American Educational Research Association.

Preston, V. (1991). *Mathematics and science curricula in elementary and secondary education for American Indian and Alaska native students*. Washington DC: Department of Education, Indian Nations at Risk Task Force. (ERIC Document Reproduction Service No. ED343767).

Rice, P. R., Poth, J., Griffing, D. F., Kelly, D. C., Marcum, S. D., & Priest, J. (1994). X-days for the calculus-based introductory course. *The Physics Teacher, 32*(3), 178-181.

Ryan, A. (1994). Preserving integration within the national curriculum in primary schools: Approaching a school development plan. In A. Pollard & J. Bourne (Eds.), *Teaching and learning in the primary school* (pp. 194-205). New York: Routledge.

Selby, C. C. (1993). Outcomes-based education. *The Science Teacher, 60*(7), 48-51.

Southwell, C. (1994). Mathematics in context. *Mathematics in School, 23*(1), 12-14.

Stevenson, C., & Carr, J. F. (Eds.). (1993). *Integrated studies in the middle grades: Dancing through walls*. New York: Teachers College Press.

Stuessy, C. L. (1994). A model for preservice teacher preparation that integrates the teaching and learning of mathematics and science. *School Science and Mathematics, 94*(1), 30-31.

Underhill, R. G., Abdi, W. S., & Peters, F. P. (1994). The Virginia State Systemic Initiative: A brief overview of the lead teacher component and a description of the evolving mathematics & science integration outcomes. *School Science and Mathematics, 94*(1), 26-29.

Van Haneghan, J., Barron, L., Young, M., Williams, S., Vye, N., & Bransford, J. (1992). The Jasper Series: An experiment with new ways to enhance mathematical thinking. In D. F. Halpern (Ed.), *Enhancing thinking skills in the sciences and mathematics* (pp. 15-38). Hillsdale, NJ: Erlbaum.

Wagner, J. R. (2000). Sneaking mathematical concepts through the back door of the introductory geology classroom. *Mathematical Geology, 32*(2), 217-229.

SECTION 2: INSTRUCTION [I] LITERATURE

Aiello-Hatchman, J., & Duren, P. E. (1991). SSMILes. It's not all garbage! *School Science and Mathematics, 91*(6), 272-275.

Alcaro, P. C., Alston, A. S., & Katims, N. (2000). Fractions attack: Children thinking and talking mathematically. *Teaching Children Mathematics, 6*(9), 562-567.

Anderson, A. (1993). A means to an end. *Mathematics Teaching, 142*, 34-37.

Anderson, A. (1994). Mathematics in context: Measurement, packaging and caring for our environment. *School Science and Mathematics, 94*(3), 146-150.

Anderson, E. J. (1994). Simplifying significant figures. *The Science Teacher, 61*(7), 31-33.

An-Guo, F. (1992). The graphical solution. *The Physics Teacher, 30*(6), 378-379.

Anthony, J. L. (1994). Race car rally. Make a pit stop to tune up science learning. *Science and Children, 31*(5), 26-29.

Baartmans, B. G., & Sorby, S. A. (1996). Making connections: Spatial thinking and engineering drawings. *The Mathematics Teacher, 89*(4), 348-357.

Baker, W. P., & Thomas, C. L. (1998). Gummy bear genetics. *The Science Teacher, 65*(8), 25-27.

Barrow, L. H., Burchett, B. M., Germann, P. J., & Callison, P. (1994). SSMILes. Get on track. *School Science and Mathematics, 94*(6), 326-327.

Bartels, B. H. (1998). Truss(t)ing triangles. *Mathematics Teaching in the Middle School, 3*(6), 394-396.

Beckmann, C., & Rozanski, K. (1999). Graphs in real time. *Mathematics Teaching in the Middle School, 5*(2), 92-99.

Belsky, N. A. (1998). Mission mathematics by the month. *Teaching Children Mathematics, 91*(3), 408-409.

Bennett, B. K. (1996). Now and then: The long-distance doctor. *Mathematics Teaching in the Middle School, 1*(10), 802-806.

Beougher, C. (1994). Making connections with teddy bears. *The Arithmetic Teacher, 41*(7), 354-362.

Berlin, D. F., & White, A. L. (1993). *Integration of science and mathematics: What parents can do*. Columbus, OH: The National Center for Science Teaching and Learning.

BEST COPY AVAILABLE

Berr, S. (1994). Experiencing the eclipse. *The Science Teacher, 61*(4), 29-33.

Biehl, L. C. (1998). Forest fires, oil spills, and fractal geometry: An investigation in two parts. Part 1: Cellular automata and modeling natural phenomena. *The Mathematics Teacher, 91*(8), 682-690, 696-698.

Biehl, L. C. (1999). Forest fires, oil spills, and fractal geometry: An investigation in two parts. Part 2: Using fractal complexity to analyze mathematical models. *The Mathematics Teacher, 92*(2), 128-130, 136-139.

Bisbee, G. D., & Conway, D. M. (1999). Studying proportions using the capture-recapture method. *The Mathematics Teacher, 92*(3), 215-218.

Blanchard, T. P. (1993). Science on display: The cosmic clock. *Science Scope, 17*(2), 37.

Blomquist, S. L. (1993). SSMILes. Metric volume in science and mathematics instruction. *School Science and Mathematics, 93*(8), 440-444.

Blomquist, S. L. (1996). SSMILes. Reaching for the stars. *School Science and Mathematics, 96*(3), 158-163.

Bogard, L. D. (1993). Endangered species alert. *Science Scope, 16*(6), 46-48.

Borlaug, V. A. (1993). From algebra to calculus - A Tonka toy truck does the trick. *The Mathematics Teacher, 86*(4), 282-287.

Bosch, W., Sizoo, J., Curtis, A., Klein, S., Micale, C., & Lin, E. (1997). Fishy formulas. *The Mathematics Teacher, 90*(8), 666-671.

Brekke, S. E. (1999). A mathematical physics for all students. *The Physics Teacher, 37*(9), 557.

Brody, M. J., & deOnis, A. (2001). Fossil forecasting. *The Science Teacher, 68*(9), 20-25.

Browning, C. A., & Channell, D. E. (1992). A "handy" database activity for the middle school classroom. *The Arithmetic Teacher, 40*(4), 235-238.

Brueningsen, C., & Krawiec, W. (1993). Planets and pucks. *The Science Teacher, 60*(7), 39-41.

Brunner, R. B., & Brunner, C. E. (1994). How much does camouflage help? *The Mathematics Teacher, 87*(9), 676-681.

Brutlag, D., & Maples, C. (1992). Making connections: Beyond the surface. *The Mathematics Teacher, 85*(3), 230-235.

Burghardt, B., & Heilman, G. (1994). Water matters. *Teaching Children Mathematics, 1*(1), 24-25.

Caples, L. G. (1992). Squeal those tires! Automobile-accident reconstruction. *The Mathematics Teacher, 85*(10), 56-61.

Cavalli-Sforza, V., Weiner, A. W., & Lesgold, A. M. (1994). Software support for students engaging in scientific activity and scientific controversy. *Science Education, 78*(6), 577-599.

Cave, L. (1997). Super-jumbo jet: An airborne village. *Mathematics Teaching in the Middle School, 3*(2), 128-131.

Chessin, D. A., & Shaw, J. M. (1994). IDEAS. Recycling. *The Arithmetic Teacher, 41*(9), 534-543.

Chia, D. T. (1998). Weather mathematics: Integrating science and mathematics. *Teaching Children Mathematics, 5*(1), 19-22.

Christensen, A., & Christian, B. (1997). Dealing with data. *The Science Teacher, 64*(6), 38-41.

Clarke, D. (1993). Watching your weight. *The Mathematics Teacher, 86*(5), 358-359.

Clason, R., & Frank, M. (1994). Assembly activities: Symmetries and quasicrystal patterns. *School Science and Mathematics, 94*(7), 381-386.

Clason, R., Peters, W., & Frank, M. (1993). Quasicrystals and the penrose patterns: A geometry activity with a scientific application. *School Science and Mathematics*, 93(7), 344-350.

Clemmitt, S. (1996). Accessible internet data. *The Science Teacher, 63*(3), 48-50.

Cognition and Technology Group at Vanderbilt. (1993a). The Jasper experiment: Using video to furnish real-world problem-solving contexts. *The Arithmetic Teacher, 40*(8), 474-478.

Collins, L. T. (1994). Osmosis in potato cells. *The Science Teacher, 61*(4), 48-49.

Conte, A. E., & Weber, R. E. (1999). Is technology the best hope for teaching students about mathematics and science? *The Technology Teacher, 59*(1), 19-23.

Corner, R. C., & Corner, T. R. (1994). Chi-square analysis. *The Science Teacher, 61*(4), 44-47.

BEST COPY AVAILABLE

Cox, P., & Bridges, L. (1999). Calculating human horsepower. *The Mathematics Teacher, 92*(3), 225-228.

Crippen, K. J., & Curtright, R. D. (1998). Modeling nuclear decay: A point of integration between chemistry and mathematics. *Journal of Chemical Education, 75*(11), 1434-1436.

Crippen, K. J., Curtright, R. D., & Brooks, D. W. (2000). Mole mapping: Using a graphing calculator as a tool for solving mole problems. *The Science Teacher, 67*(7), 36-39.

Crouse, R. J., & Slover, C. W. (1993). Mathematics and medical indexes: A life-saving connection. *The Mathematics Teacher, 86*(8), 624-626.

Czerniak, C. M. (1993). The Jurassic spark. *Science and Children, 31*(2), 18-22.

Czerniak, C. M. (1994). Potpourri: The one-hour science fair. *Science Scope, 17*(5), 24-25.

Czerniak, C. M., & McDonald, J. (1993). Shark attack. *Science Scope, 17*(2), 16-20.

D'Agostino, J. B., Kalin-Miller, M., Keegan, M., Schiller, D., & Freeman, S. (1994). Dancing for food: The language of the honeybees. *Science and Children, 31*(8), 15-17, 50.

Dance, R. A., & Sandefur, J. T. (1997). Approaching the speed of light with class. *The Mathematics Teacher, 90*(4), 314-319.

De-Jong, M. L. (1993). Graphing electric potential. *The Physics Teacher, 31*(5), 270-272.

DelForge, C., DelForge, L., & DelForge, C. (1993). *Integrating aerospace. Science Scope, 17*(3), 41-44.

Demana, F., & Waits, B. K. (1993). The particle-motion problem. *The Mathematics Teacher, 86*(4), 288-292.

Dengerud-Au, M. (2000). Strength of wood beams: An engineering application. *The Mathematics Teacher, 93*(7), 544-549.

Dion, G. S., & Fetta, I. B. (1996). Everybody talks about it! Weather investigations. *The Mathematics Teacher, 89*(2), 160-165.

Dispezio, M. A. (1993). Eratosthenes and the earth. *Science Scope, 16*(6), 14-17.

Donivan, M. (1993). A dynamic duo takes on science. *Science and Children, 31*(2), 29-32.

Dujari, A., & Bosse, M. J. (2000). Measuring molecules. *The Science Teacher, 67*(5), 32-35.

Eagles, C. (1994). Mad for metric measure. *Science and Children, 31*(4), 23-25, 59.

Easterday, K. E., & Bass, D. T. (1993a). SSMILes. Viewing weather conditions with a mathematical eye (humidity and pressure as part of a function). *School Science and Mathematics, 93*(3), 160-165.

Easterday, K. E., & Bass, D. T. (1993b). Using environmental issues to integrate science and mathematics. *School Science and Mathematics, 93*(5), 234-236.

Eckhaus, A., & Wolfe, R. (1997). Gathering and interpreting data. *Science Scope, 21*(4), 44-45.

Edwards, T. (1995). Building mathematical models of simple harmonic and damped motion. *The Mathematics Teacher, 88*(1), 18-22.

Edwards, T. G. (1995). Students as researchers: An inclined-plane activity. *Mathematics Teaching in the Middle School, 1*(7), 532-535.

Eichman, J. C., & Brown, J. A. (1994). Global warming? *The Science Teacher, 61*(4), 24-28.

Ellenburg, R. (1993). New and improved. *Learning, 22*(1), 45.

Emenaker, C. (2000). SSMILes. Egging your students on. *School Science and Mathematics, 100*(5), 260-269.

Emenaker, C. (2001). Just thinkin' of the rain. *The Mathematics Teacher, 94*(4), 272-276.

Engelland, H. (1994). Catapulting, bringing the Middle Ages to the middle level classroom. *Science Scope, 17*(5), 31-36.

Evans, H. E., II. (1996). Ray tracing with hinged mirrors. *The Physics Teacher, 34*(5), 314-315.

Evans, J. H. (1999). Sorting out seeds. *Science Scope, 22*(7), 18-21.

Farenga, S. J., Joyce, B. A., & Ness, D. (2001a). The science and mathematics of nature. *Science Scope, 25*(2), 10-13.

Farenga, S. J., Joyce, B. A., & Ness, D. (2001b). Where do we go next? *Science Scope, 24*(5), 48-51.

Farnsworth, D. L. (1991). Sharing teaching ideas: Introducing probability. *The Mathematics Teacher, 84*(7), 542-543.

Fiore, G. (2000). An out-of-math experience: Einstein, relativity, and the developmental mathematics student. *The Mathematics Teacher, 93*(3), 194-199.

Fishman, J. (1993). Analyzing energy and resource problems: An interdisciplinary approach with mathematical modeling. *The Mathematics Teacher, 86*(8), 628-633.

Flores, A. (1992). Mathematical connections with a spirography. *The Mathematics Teacher, 85*(2), 129-137.

Flores, A. (1995). Connections in proportional reasoning: Levers, arithmetic means, mixtures, batting averages, and speeds. *School Science and Mathematics, 95*(8), 423-430.

Flores, A., & Birge, L. (1998). SSMILes. Ancestry of humans and bees. *School Science and Mathematics, 98*(2), 99-103.

Flores, A., & Guest, A. (1997). SSMILes. Fibonacci in the forest. *School Science and Mathematics, 97*(7), 388-392.

Flores, A., & Perkins, I. (1996). SSMILes. Tin-can ice cream. *School Science and Mathematics, 96*(1), 46-49.

Flores, A., & Turner, E. E. (2001). SSMILes. Inclined planes and motion detectors: A study of acceleration. *School Science and Mathematics, 101*(3), 154-161.

Flournoy, B. E., Cook-Bax, J. E., & Harris, L. (2001). The science-mathematics connection: Using technology in an interdisciplinary module. *The Science Teacher, 68*(6), 63-66.

Foat, J., & Siegel, P. (1994). Transcendental measurementation. *The Physics Teacher, 32*(4), 231-233.

Forkey, C. (1996). Data collecting calculators. *The Science Teacher, 63*(3), 18-20.

Funkhouser, K., & Deslich, B. J. (2000). Integrating forensic science. *The Science Teacher, 67*(6), 32-35.

Furner, J. M., & Ramirez, M. (1999). Making connections: Using GIS to integrate mathematics and science. *TechTrends, 43*(4), 34-39.

Gampel, M. B. (1993). Subterranean city. *Science Scope, 16*(6), 64-66.

Genoni, M. (1994). Potpourri: Timing televiewing. *Science Scope, 17*(5), 26.

Giberson, K., & Brown, L. (1997). Hello out there: Coding messages for extraterrestrials is a prime activity. *The Science Teacher, 64*(8), 25-27.

Glaister, P. (1993). Graphing pH curves. *School Science Review, 75*(271), 100-101.

Goates, W. (2000). Lavosier measures with polymers. *Science Scope, 24*(1), 30-33.

Hajda, J., & Hajda, L. B. (1994). Sparking interest in electricity. *Science Scope, 18*(3), 36-39.

Hammond, M. (1993a). Ramps. *Micromath, 9*(1), 7-9.

Haug, M. (1998). Up the creek with a paddle. *The Mathematics Teacher, 91*(6), 456-460.

Hedgepeth, D. J. (1994). SSMILes. Using models to teach about remote sensing and image processing. *School Science and Mathematics, 94*(1), 46-51.

Hedgepeth, D. J. (1995). SSMILes. Measuring the nutrient tolerance of algae. *School Science and Mathematics, 95*(2), 102-107.

Helisek, H., & Pratt, D. (1994). Project reconstruct. *Science and Children, 31*(7), 25-28.

Helme, B. D. (1995). Mathematical connections: Proportions and modeling in the solar system. *Mathematics Teaching in the Middle School, 1*(6), 488-489.

Hendrix-Martin, E. (1997). Students use their bodies to measure animals. *Teaching Children Mathematics, 3*(8), 426-430.

Hernandez, N. G., & Milson, J. L. (1993). SSMILes. The best Lindy 500 racer! *School Science and Mathematics, 93*(7), 373-384.

Hildreth, D. P., & Matthews, C. E. (1997). Get a kick out of physics. *The Science Teacher, 64*(9), 34-36.

Hines, C. (1992). Science notes: A student guide to understanding reacting mass calculations. *School Science Review, 74*(266), 85-86.

Holden, C. (1993). Computer networks bring 'real science' to the schools. *Science, 261*, 980-981.

Hopkins, M. H., & Gard, D. M. (1992). IDEAS. Space nutrition. *The Arithmetic Teacher, 40*(2), 95-96, 100.

Iijima, R., & Rubeck, M. (1998). Breakfast density. *Science and Children, 36*(2), 22-25.

Indiana State Department of Education. (1991). *Save our streams and waterways*. Indianapolis: Center for School Improvement and Performance. (ERIC Document Reproduction Service No. ED338509)

Inman, D. (1997). Water rockets and indirect measurement. *Science Scope, 20*(7), 22-23.

Iovinelli, R. (1997). Activities for the logistical growth model; or, invasion of the killer moths. *The Mathematics Teacher, 90*(7), 588-593.

Jabon, D., Nord, G., Wilson, B. W., Coffman, P., & Nord, J. (1996). Medical applications of systems of linear equations. *The Mathematics Teacher, 89*(5), 398-402.

Jaffe, D., Griffin, D., & Ricker, J. (1997). Analyzing cigarette smoke: Students investigate the tar and carbon monoxide content of cigarettes. *The Science Teacher, 64*(9), 29-33.

Johnson, A. (2000). The Jurassic classroom. *The Mathematics Teacher, 93*(2), 102-105, 109-113.

Johnson, W. W. (1994). Teaching mathematical and scientific concepts through the use of a pneumatic arm wrestling machine. *The Technology Teacher, 53*(6), 15-17.

Jones, G. A., Rich, B. S., & Day, R. (1996). The assessment of a complex problem: The bungee jump project. *School Science and Mathematics, 96*(2), 68-74.

Jones, R. (1995). How big, how tall? The scaling principle answers. *Science Scope, 19*(2), 22-26.

Jones, R. C. (1994). How much is a million? *Science Scope, 18*(2), 28-31.

Jorgensen, B. (1996). Hamster math: Authentic experiences in data collection. *Teaching Children Mathematics, 2*(6) 336-339.

Keller, J. D., & Berry, K. A. (2001). Burning questions. *Science Scope, 24*(7), 28-32.

Keller, J. D., & Brickman, B. (1998). The ball Olympics: Up and down, all around. *Science and Children, 32*(2), 26-30, 56.

Kennedy, J. B. (1996). An interest in radioactivity. *The Mathematics Teacher, 89*(3), 209-214, 228-230.

Kim, H. (1997). Angled sunshine, seasons, and solar energy. *The Mathematics Teacher, 90*(7), 528-532.

Koch, H. (1995). Simplifying stoichiometry. *The Science Teacher, 62*(8), 36-39.

Koenig, D., & Kuznik, F. (1994). USA TODAY: Connecting science and mathematics principles to the daily news. *School Science and Mathematics, 94*(1), 15-17.

Lamb, J., Jr. (1991). A mathematical model of the great solar eclipse of 1991. *School Science and Mathematics, 91*(7), 293-296.

Lamphere, P. (1995). Zoo mania. *Teaching Children Mathematics, 1*(9), 556-560.

Langdon, R. J. (1995). Dig into mining activities. *Science Scope, 19*(1), 28-33.

LeBeau, S. (1997). Mathematics and the environment. *Teaching Children Mathematics, 3*(8), 440-441.

Lebofsky, L. A., & Lebofsky, N. R. (1998). Mapping mars. *Science Scope, 22*(1), 33-35.

Lee, C. (1997). The integration of math and science via centroids. *School Science and Mathematics, 97*(4), 200-205.

Lehman, J. R. (1991). SSMILes. Measurement: The human body. *School Science and Mathematics, 91*(7), 325-327.

Lehman, J. R. (1994b). Measure up to science. *Science and Children, 31*(5), 30-31.

Lehman, J. R., & Kandl, T. M. (1995). SSMILes. Popcorn investigations for integrating mathematics, science, and technology. *School Science and Mathematics, 95*(1), 46-49.

Levine, Z. H. (1993). How to measure the radius of the Earth on your beach vacation. *The Physics Teacher, 31*(7), 440-441.

Lifer, S. (1995, May). What size is your car engine? A graphing calculator problem. *Ohio Journal of School Mathematics,* 31, 34-39.

Lindgren, J., & Cushall, M. (2001). You can always tell a dancer by her feet. *Science Scope, 24*(4), 12-16.

March, R. H. (1993). The mystical 'Quadratic formula'. *The Physics Teacher, 31*(3), 147.

Marks, S. K., Vitek, J. D., & Allen, K. P. (1996). Remote sensing: Analyzing satellite images to create higher order thinking skills. *The Science Teacher, 63*(3), 28-31.

Marsh, P., & Ripa, M. (1998). A sweet start to science. *Science Scope, 22*(1), 18-21.

Matthews, C. E., McDuffie, K., Campbell, T., Walling, J., & Craig, J. (1999). Planetary paths. *Science Scope, 22*(8), 10-14.

BEST COPY AVAILABLE

May, K. (1994). The case of the cavity. *Science Scope, 18*(2), 23-27.

Mayotte, G. A. (1994). An activity that measures up. *Science Scope, 18*(3), 45.

McDonald, J., & Czerniak, C. (1998). SSMILes. Scaling sharks. *School Science and Mathematics, 98*(7), 397-399.

McDuffie, T. F., & Palmer, A. (2000). How big are raindrops? *The Science Teacher, 67*(2), 46-50.

McGlone, C., & Nieberle, G. M. (2000). Using Hooke's law to explore linear functions. *The Mathematics Teacher, 93*(5), 391-398.

McGuire, T. (1993). The Gaia nineties. *The Science Teacher, 60*(6), 31-35.

Mcintosh, K. (1993). Animals that aren't cuddly. *Science Scope, 16*(6), 42-44.

Meltzer, D. E., & Espinoza, A. M. (1997). Guided inquiry: Let students discover the laws of physics for themselves. *Science Scope, 21*(2), 28-31.

Methany, D. (2001). Consumer investigations: What is the "best" chip? *Teaching Children Mathematics, 7*(7), 418-420.

Miller, K. W., & Davison, D. M. (2001). A cultural and linguistic approach to teaching science and mathematics to Native American students. *Science Educator, 10*(1), 38-42.

Milojevic, S., & Clemons, P. (1993). What's working in education: Trip to pumpkin farm injects reality into math and science. *Curriculum Review*, 33(1), 12.

Mitchell, C. E., Miller L. D., & Paine, G. (1995). Scientific methodology and elementary school mathematics. *School Science and Mathematics, 95*(5), 260-263.

Monhardt, R., & Henriques, L. (1997). Interdisciplinary learning: Adding an egg to the mix. *Science Activities, 34*(1), 22-28.

Moore, T. (1995). Physics with shampoo bottle cars. *The Technology Teacher, 54*(7), 9-10.

Morita, J. G. (1999). Capture and recapture: Your students' interest in statistics. *Mathematics Teaching in the Middle School, 4*(6), 412-418.

Moss, R. (1996). A multimedia computer program to teach statistics in genetics: Walking through the chi-square test. *Journal of College Science Teaching, 25*(4), 270-273.

Murphey, A. (1994). Potpourri: Are all medium colas the same size? *Science Scope, 17*(5), 25.

Nelson, V., & Stanko, A. (1992). Math safari. *Learning, 21*(1), 43-51.

Newburgh, R. (1996). Real, imaginary, and complex numbers: Where does the physics hide? *The Physics Teacher, 34*(1), 23-25.

Nickel, J. A. (1994). Equations. *The Science Teacher, 61*(6), 38-41.

Nord, G. D., & Nord, J. (1995). An example of algebra in Lake Roosevelt. *The Mathematics Teacher, 88*(2), 116-120.

Nord, G. D., & Nord, J. (1998). Sediment in Lake Coeur d'Alene, Idaho. *The Mathematics Teacher, 91*(4), 292-296.

Oakes, J. M. (1997). Discovery through graphing. *The Science Teacher, 64*(1), 33-35.

O'Brien, T., & Seager, D. (2000). 5 E(z) steps to teaching Earth-Moon scaling: An interdisciplinary mathematics/science/technology mini-unit. *School Science and Mathematics, 100*(7), 390-395.

O'Brien, T., Stannard, C., & Telesca, A. (1994). A baker's dozen of discrepantly dense demos. *Science Scope, 18*(2), 35-38.

Ollendyke, C. K. (1993). Space day. *Science Scope, 16*(6), 40-41.

Ostlund, K. (1993). Creating a culture. *Science Scope, 16*(6), 20-24.

Pacyga, R. (1994). Implementing the curriculum and evaluation standards: Making connections by using molecular models in geometry. *The Mathematics Teacher, 87*(1), 43-47.

Papay, K., Serum, L., & Donnelly, J. (1996). Predicting the orbits of satellites with a TI-85 calculator. *The Science Teacher, 63*(4), 33.

Passarello, L. M., & Fennel, F. (1992). IDEAS. How big is your heart? *The Arithmetic Teacher, 39*(6), 32-39.

Patterson, J. (2000). Physical principles versus mathematical rigor. *The Physics Teacher, 38*(4), 214.

Pautz, R. (1993). Construct a colorimeter. *The Science Teacher, 60*(7), 42-44.

Pearlman, S., & Pericak-Spector, K. (1993). SSMILes. Mealworm math. *School Science and Mathematics, 93*(6), 332-337.

Pearlman, S., & Pericak-Spector, K. (1994). A series of seriation activities. *Science and Children, 31*(4), 37-39.

Pearlman, S., & Pericak-Spector, K. (1995a). SSMILes. Chocolate chip cookies: A consumer unit. Part I: Using statistics. *School Science and Mathematics, 95*(3), 154-159.

Pearlman, S., & Pericak-Spector, K. (1995b). SSMILes. Chocolate chip cookies: A consumer unit. Part II: Investigating snacks. *School Science and Mathematics, 95*(4), 209-216.

Pleacher, M. (1998). The science and math connection. *The Science Teacher, 65*(2), 48-51.

Poelker, B. (1993). Eratosthenes updated. *Science Scope, 16*(6), 18-19.

Redmond, A. (1993). Exploring mars. *Science Scope, 16*(6), 36-39.

Richardson, D. (1997). Mapping Venus: Modeling the Magellan mission. *The Science Teacher, 64*(8), 22-24.

Riddle, B. (1994a). Making time. *Science Scope, 18*(1), 72-74.

Riddle, B. (1994b). Scope on the skies: The sunscape. *Science Scope, 18*(2), 52-53.

Roebuck, K. I., & Warden, M. A. (1998). Searching for the center on the mathematics-science continuum. *School Science and Mathematics, 98*(6), 328-333.

Ronau, R. N., & Karp, K. S. (2001). Power over trash: Integrating mathematics, science, and children's literature. *Mathematics Teaching in the Middle School, 7*(1), 26-31.

Rouncefield, M. (1993). Pendulums go non-parametric! *Mathematics in School, 22*(1), 6-7.

Rubink, W. L., & Taubee, S. R. (1999). Mathematical connections from biology: Killer bees come to life in the classroom. *Mathematics Teaching in the Middle School, 4*(6), 350-356.

Rubino, A. M., & Duerling, C. K. (1991). Around the world in science class. *Science and Children, 28*(7), 37-39.

Rule, A. C. (1991). SSMILes. Super sand sifting (sieving different size fractions of sediments). *School Science and Mathematics, 91*(8), 382-385.

Rule, A. C. (1992). SSMILes. Investigating the uses of numbers in science and everyday life. *School Science and Mathematics, 92*(3), 157-162.

Rule, A. C. (1999). SSMILes. Descriptive adjective object boxes. *School Science and Mathematics, 99*(7), 400-408.

Russo, R. (1997). An archaeoastronomical adventure. *The Science Teacher, 64*(2), 41-43.

Rybka, J. D. (1991). Factor labelling. *The Science Teacher, 58*(8), 36-37.

Ryden, R. (1999). Astronomical math. *The Mathematics Teacher, 92*(9), 786-792.

Rye, J. A. (1999). SSMILes. Exploring dietary kilocalories: An activity exemplifying the personal value of science and mathematics. *School Science and Mathematics, 99*(2), 94-101.

Sandefur, J. T. (1992). Drugs and pollution in the algebra class. *The Mathematics Teacher*, 85(2), 139-145.

Sanny, J. (1999). Measuring the diameter of your blind spot. *The Physics Teacher, 37*(6), 348-349.

Sawicki, M. (1996). Using the solar eclipse to estimate Earth's distance from the Moon. *The Physics Teacher, 34*(4), 232-233.

Schlenker, R. M., & Schlenker, K. R. (2000). Integrating science, mathematics, and sociology in an inquiry-based study of changing population density. *Science Activities, 36*(4), 16-19.

Schmidt, D. (2000). After the bell: Adopting and observing. *Science Scope, 24*(3), 10-14.

Schmidt, M. F., Jr. (1995). Teaching physics concepts and numbers. *The Physics Teacher, 33*(9), 584-585.

Schmidt, S. M., & Palmer, C. (2000). Rock cycle. *The Science Teacher, 67*(8), 34-37.

Sconyers, J., & Trautwein, C. (2000). Putting a spring in Archimedes' step. *Science Scope, 23*(5), 14-16.

Secosky, J. J. (1995). A junket to Jupiter. *The Science Teacher, 62*(8), 24-26.

Seidel, J. D. (1998). Symmetry in season. *Teaching Children Mathematics, 4*(5), 244-249.

Shams, M., & Boteler, T. (1993). Jurassic Park: Adventure in learning. *Science Scope, 17*(1), 12-17.

Shannon, B. K. J. (1995). Our diets may be killing us. *Mathematics Teaching in the Middle School, 1*(5), 376-382.

Sherman, H. J., & James, M. (1994). Quantitatively speaking. *Science Scope, 18*(3), 31-33.

Sickle, M. V., & Dickman, C. (1996). Science across the disciplines. *Science Scope, 20*(3), 22-24.

Smith, H. (1997). How not to integrate mathematics. *Australian Primary Mathematics Classroom, 2*(3), 11-13.

Smith, J. P., III. (1999). Preparing students for modern work: Lessons from automobile manufacturing. *The Mathematics Teacher, 92*(3), 254-258.

Snyder, J. (1999). The oak leaf: Connecting geometry and biology. *The Mathematics Teacher, 92*(4), 294-298.

Spence, B. S. (1996). The arcs of archaeology. *Mathematics Teaching in the Middle School, 1*(9), 688-693.

Stalling, M., & Ottinger, T. (1994). Lessons for a landfill. *The Science Teacher, 61*(9), 20-25.

Stallings, L., & Wimpey, K. (2000). Blowing bubbles: An interdisciplinary science and mathematics lab. *Science Scope, 23*(5), 24-27.

Stearns, C., & Courtney, R. (2000). Content standard D: Designing assessments with the standards. *Science and Children, 37*(4), 51-55.

Stockdale, D. L. (1997). Portable planetarium. *The Science Teacher, 64*(7), 42-45.

Stor, M., & Briggs, W. L. (1998). Dice and disease in the classroom. *The Mathematics Teacher, 91*(6), 464-468.

Stump, S. L. (2000). Doing mathematics with bicycle gear ratios. *The Mathematics Teacher, 93*(9), 762-768, 775-776.

Sumrall, W. J., & Forslev, A. W. (1994). Spreadsheet meteorology. *Science Scope, 18*(1), 36-38.

Sumrall, W. J., & Halpin, R. F. (2000). Integration and presentation. *Science and Scope, 24*(1), 68-71.

Swift, R. L., & Crites, T. (1995). Integrating science and mathematics: Number of vents and rate of flow. *School Science and Mathematics, 95*(7), 359-364.

Tappin, L. (1994). Analyzing data relating to the Challenger disaster. *The Mathematics Teacher, 87*(6), 423-426.

Teachworth, M. (1994). Build a bed of nails. *The Science Teacher, 61*(6), 54-56.

Texley, J. (2001). Adding math to biology. *The Science Teacher, 68*(4), 36-39.

Theriault, R. (1994). Firing range physics. *The Science Teacher, 61*(2), 18-20.

Thompson, K. W., & Harrell, M. E. (1997). Geometry and Moon phases. *Science Scope, 21*(2), 35-37.

Thomson, B. S., & Hartog, M. D. (1993). *Activities to teach mathematics in the context of environmental studies*. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education. (ERIC Document Reproduction Service No. ED359052)

Thornton, C. A., Damkoehler, D. D., Gehrenbeck, H., & Jones, G. A. (1995). The children's rain forest. *Teaching Children Mathematics, 2*(3), 144-148.

Tippins, D. J., & Pate, P. E. (1991). Lifestyles in life science. *Science Scope, 15*(3), 39-42.

Tometsko, N. R., & Bhattacharya, D. N. (1991). Sharing teaching ideas: Earthquakes and black coffee. *The Mathematics Teacher, 84*(7), 541-542.

Tretter, T. R. (2000). Physical science lab essentials. *The Science Teacher, 67*(7), 48-52.

Trezise, K. (1995). Investigations. Food for thought. *Teaching Children Mathematics, 2*(3), 170-174.

Trezise, K. A. (1998). Mathematics fitness. *Mathematics Teaching in the Middle School, 3*(7), 458-462.

Turkall, S. F. (1996). Student-designed river study. *Science Scope, 19*(7), 22-25.

Vacher, H. L., & Mylroie, J. E. (2001). Connection with geology: Where's the end of the cave? *The Mathematics Teacher, 94*(8), 640-646.

Van Dyke, F. (1994). Relating to graphs in introductory algebra. *The Mathematics Teacher, 87*(6), 427-437, 438.

Van Dyke, F. (1996). The inverse of a function. *The Mathematics Teacher, 89*(2), 121-126, 132-133.

Wagner-Pine, L., & Keith, D. G. (1994). SSMILes. Investigating various volcanic eruptions and volcano heights. *School Science and Mathematics, 94*(8), 432-438.

BEST COPY AVAILABLE

Walker, N. (1993). Weather data and statistical techniques. *School Science and Mathematics, 93*(4), 188-190.

Wandersee, J. H. (1992). Exploring human growth: Using a calculator to integrate mathematics and science. *School Science and Mathematics, 92*(2), 96-98.

Weber, R. (1994). Star-dome in the making. *Science Scope, 18*(1), 25-27.

Welch, L. A. (1993). A model of microevolution in action. *The American Biology Teacher, 55*(6), 362-365.

Westerberg, J., & Whiting, J. (1992). Popcorn: An explosive mixture of general mathematics and general science. *The Mathematics Teacher, 85*(4), 306-308.

Wetzel, D. R. (2000). Fan car physics. *Science Scope, 23*(4), 29-31.

Whitmer, J. C. (1992). SSMILes. Thinking small: Milligrams, micrograms and counting atoms. *School Science and Mathematics, 92*(1), 40-44.

Wiest, L., & Quinn, R. (2000). Colourful probabilities: An integrated maths-science lesson. *Australian Primary Mathematics Classroom, 5(*2), 19-23.

Wiley, D. A., & Royce, C. A. (2000). Crash into meteorite learning. *Science and Children, 37*(8), 16-19.

Wilson, D. A. (1995). Home energy survey. *The Science Teacher, 62*(8), 32-35.

Worden, G. P., Murphy, B. G., & Stevens, D. (1994). Bungee basics. *The Science Teacher, 61*(7), 50-53.

Young, P. G. (1998). Probability, matrices, and bugs in trees. *The Mathematics Teacher, 91*(5), 402-406, 412-415.

SECTION 3: RESEARCH [R] LITERATURE

Angel, S. A., & LaLonde, D. E. (1998). Science success strategies: An interdisciplinary course for improving science and mathematics education. *Journal of Chemical Education, 75*(11), 1437-1441.

Austin, J. D., Converse, R. E., Sass, R. L., & Tomlins, R. (1992). Coordinating secondary school science and mathematics. *School Science and Mathematics, 92*(2), 64-68.

Austin, J. D., Hirstein, J., & Walen, S. (1997). Integrated mathematics interfaced with science. *School Science and Mathematics, 97*(1), 45-49.

Basista, B., Tomlin, J., Pennington, K., & Pugh, D. (2001). Inquiry-based integrated science and mathematics professional development program. *Education, 121*(3), 615-624.

Berg, C. A., & Smith, P. (1994). Assessing students' abilities to construct and interpret line graphs: Disparities between multiple choice and free-response instruments. *Science Education, 78*(6), 527-554.

Berlin, D. F. (1994). The integration of science and mathematics education: Highlights from the NSF/SSMA Wingspread Conference plenary papers. *School Science and Mathematics, 94*(1), 2-4.

Berlin, D. F., & Hillen, J. A. (1994). Making connections in math and science: Identifying student outcomes. *School Science and Mathematics, 94*(6), 283-290.

Berlin, D. F., & White, A. L. (1991, September). *A network for Integrated Science Mathematics Teaching and Learning* (NCSTL Monograph Series 2). Columbus, OH: The National Center for Science Teaching and Learning. (ERIC Document Reproduction Service No. ED349167)

Berlin, D. F., & White, A. L. (1992). Report from the NSF/SSMA Wingspread Conference: A Network for Integrated Science and Mathematics Teaching and Learning. *School Science and Mathematics, 92*(6), 340-342.

Berlin, D. F., & White, A. L. (1994). The Berlin-White Integrated Science and Mathematics Model. *School Science and Mathematics, 94*(1), 2-4.

Berlin, D. F., & White, A. L. (1995a). Connecting school science and mathematics. In P. A. House & A. F. Coxford (Eds.), *1995 National Council of Teachers of Mathematics yearbook. Connecting mathematics across the curriculum* (pp. 22-33). Reston, VA: National Council of Teachers of Mathematics.

Berlin, D. F., & White, A. L. (1995b). Using technology in assessing integrated science and mathematics learning. *Journal of Science Education and Technology, 4*(1), 47-56.

Berlin, D. F., & White, A. L. (1998). Integrated science and mathematics education: Evolution and implications of a theoretical model. In B. J. Fraser & K. G. Tobin (Eds.), *International handbook of science education* (pp. 499-512). Dordrecht, Netherlands: Kluwer Academic Publishers.

Berlin, D. F., & White, A. L. (2001). Science and mathematics together: Implementing a theoretical model. *Science Educator, 10*(1), 50-57.

Brasell, H. M., & Rowe, M. B. (1993). Graphing skills among high school physics students. *School Science and Mathematics, 93*(2), 63-69.

Cleland, J. V., Wetzel, K. A., Zambo, R., Buss, R. R., & Rillero, P. (1999). Science integrated with mathematics using language arts and technology: A model for collaborative professional development. *Journal of Computers in Mathematics and Science Teaching, 18*(2), 157-172.

Czerniak, C. M., Weber, W. B., Jr., Sandmann, A., & Ahern, J. (1999). A literature review of science and mathematics integration. *School Science and Mathematics, 99*(8), 421-430.

Daugherty, M. K., & Wicklein, R. C. (1993). Mathematics, science, and technology teachers' perceptions of technology education. *Journal of Technology Education, 4*(2), 30-45.

Davison, D. M., Miller, K. W., & Metheny, D. L. (1995). What does integration of science and mathematics really mean? *School Science and Mathematics, 95*(5), 226-230.

Deeds, D. G., Wood, M. D., Callen, B. W., & Allen, C. S. (1999). Contemporary student attitudes about mathematics, science, and technology. *Journal of College Science Teaching, 29*(2), 86-92.

Drake, S. M. (1991). How our team dissolved the boundaries. *Educational Leadership, 49*(2), 20-22.

Elliott, B., Oty, K., McArthur, J., & Clark, B. (2001). The effect of an interdisciplinary algebra/science course on students' problem solving skills, critical thinking skills and attitudes towards mathematics. *International Journal of Mathematical Education in Science and Technology, 32*(6), 811-816.

Foss, D. H., & Pinchback, C. L. (1998). An interdisciplinary approach to science, mathematics, and reading: Learning as children learn. *School Science and Mathematics, 98*(98), 149-155.

Francis, R. G., Hill, D. M., & Redden, M. G. (1991). Mathematics and science: A shared learning cycle and a common learning environment. *School Science and Mathematics, 91*(8), 339-343.

Good, R. (1991). Editorial: Research on science-mathematics connections. *Journal of Research in Science Teaching, 28*(2), 109.

Haigh, W., & Rehfeld, D. (1995). Integration of secondary mathematics and science methods courses: A model. *School Science and Mathematics, 95*(5), 240-247.

Hale, P. (2000). Kinematics and graphs: Students' difficulties and CBLs. *The Mathematics Teacher, 93*(5), 414-417.

Huntley, M. A. (1998). Design and implementation of a framework for defining integrated mathematics and science education. *School Science and Mathematics, 98*(6), 320-327.

Huntley, M. A. (1999). Theoretical and empirical investigations of integrated mathematics and science education in the middle grades with implications for teacher education. *Journal of Teacher Education, 50*(1), 57-67.

Hurley, M. M. (2001). Reviewing integrated science and mathematics: The search for evidence and definitions from new perspectives. *School Science and Mathematics, 101*(5), 259-268.

Isaacs, A., Wagreich, P., & Gartzman, M. (1997). The quest for integration: School mathematics and science. *American Journal of Education, 106*(1), 179-206.

James, R. K., Lamb, C. E., Householder, D. L., & Bailey, M. A. (2000). Integrating science, mathematics, and technology in middle school technology-rich environments: A study of implementation and change. *School Science and Mathematics, 100*(1), 27-33.

Laurillard, D. (1992). Learning through collaborative computer simulations. *British Journal of Educational Technology, 23*(3), 164-171.

Lederman, N. G., & Niess, M. L. (1997). Integrated, interdisciplinary, or thematic instruction? Is this a question or is it questionable semantics? *School Science and Mathematics, 97*(2), 57-58.

Lee, P. (1997). *A first year evaluation study of integrated math and integrated science curricular programs in an inner city high school.* San Francisco Bay Area, CA. (ERIC Document Reproduction Service No. ED415092)

Lehman, J. R. (1994a). Integrating science and mathematics: Perceptions of preservice and practicing elementary teachers. *School Science and Mathematics, 94*(2), 58-64.

Lehrer, R., & Schauble, L. (1998). Reasoning about structure and function: Children's conceptions of gears. *Journal of Research in Science Teaching, 35*(1), 3-25.

Leonard, J. (2000). Let's talk about the weather: Lessons learned in facilitating mathematical discourse. *Mathematics Teaching in the Middle School, 5*(8), 518-523.

Leonhardt, N. A. (1998). *An ecological system curriculum: An integrated MST approach to environmental science education.* Paper presented at the International Consortium for Research in Science and Mathematics Education, Port of Spain, Trinidad. (ERIC Document Reproduction Service No. ED433995)

Loepp, F. L. (1999). Models of curriculum integration. *The Journal of Technology Studies, 25*(2), 21-25.

Lonning, R. A., & DeFranco, T. C. (1997). Integration of science and mathematics: A theoretical model. *School Science and Mathematics, 97*(4), 212-215.

Lonning, R. A., DeFranco, T. C., & Weinland, T. P. (1998). Development of theme-based, interdisciplinary, integrated curriculum: A theoretical model. *School Science and Mathematics, 98*(6), 312-318.

Mecca, P. M. (1991). *Mathematics-science integration project: A collaborative, rural school effort.* Paper presented at the annual meeting of the National Association for Research in Science Teaching, Lake Geneva, WI. (ERIC Document Reproduction Service No. ED342623)

Meier, S. L., Cobbs, G., & Nicol, M. (1998). Potential benefits and barriers to integration. *School Science and Mathematics, 98*(8), 438-445.

Merrill, C. (2001). Integrated technology, mathematics, and science education: A quasi-experiment. *Journal of Industrial Teacher Education, 38*(3), 45-61.

Miller, K. W., & Davison, D. (1998). Is thematic integration the best way to reform science and mathematics education? *Science Educator, 7*(1), 7-12.

Miller, K. W., & Davison, D. M. (1999). Paradigms and praxis: The role of science and mathematics integration. *Science Educator, 8*(1), 25-29.

Miller, L. D. (1992). Preparing elementary mathematics-science teaching specialists. *The Arithmetic Teacher, 40*(4), 228-231.

Nicol, M. P. (1997). How one physics teacher changed his algebraic thinking. *The Mathematics Teacher, 90*(2), 86-89.

Niess, M. L. (2001). A model for integrating technology in preservice science and mathematics content-specific teacher preparation. *School Science and Mathematics, 101*(2), 102-109.

Nye, B. A., & Thigpin, C. G. (1993). Examining the relationship between process-oriented staff development and classroom practices using integrated mathematics and science instructional modules. *Journal of Elementary Science Education, 5*(1), 10-26.

Onwu, G. O. M. (1993). Line graphing ability of some Nigerian secondary science students. *International Journal of Mathematical Education in Science and Technology, 24*(3), 385-390.

Pang, J., & Good, R. (2000). A review of the integration of science and mathematics: Implications for further research. *School Science and Mathematics, 100*(2), 73-82.

Preece, J., & Janvier, C. (1992). A study of the interpretation of trends in multiple curve graphs of ecological situations. *School Science and Mathematics, 92*(6), 299-306.

Rakow, S. J., & Vasquez, J. (1998). Integrated instruction: A trio of strategies. *Science and Children, 35*(6), 18-22.

Ross, J. A., & Hogaboam-Gray, A. (1998). Integrating mathematics, science, and technology: Effects on students. *International Journal of Science Education, 20*(9), 1119-1135.

Roth, W. M. (1991). The development of reasoning on the balance beam. *Journal of Research in Science Teaching, 28*(7), 631-645.

Roth, W. M. (1992). Bridging the gap between school and real life: Toward an integration of science, mathematics, and technology in the context of authentic practice. *School Science and Mathematics, 92*(6), 307-317.

Roth, W. M. (1993). Problem-centered learning for the integration of mathematics and science in a constructivist laboratory: A case study. *School Science and Mathematics, 93*(3), 113-122.

Roth, W. M., & Bowen, G. M. (1994). Mathematization of experience in a grade 8 open inquiry environment: An introduction to the representational practice of science. *Journal of Research in Science Teaching, 31*(3), 293-318.

Saeki, A., Tsukihashi, M., & Ujiie, A. (2001). A cross-curricular integrated learning experience in mathematics and physics. *Community College Journal of Research and Practice, 25*(5/6), 417-424.

Scarborough, J. D. (1993a). Integrated models for teachers. *The Technology Teacher, 52*(5), 26-30.

Slater, T. F., Coltharp, H., & Scott, S. A. (1998). A telecommunications project to empower Kansas elementary/middle level teachers as change agents for integrated science and mathematics education. *School Science and Mathematics, 98*(2), 61-66.

Smith, D. L., & Freeman, C. C. (1997). *Active and engaged? Lessons from an interdisciplinary and collaborative college mathematics and science course for preservice teachers.* Paper presented at the American Educational Research Association, Chicago, IL. (ERIC Document Reproduction Service No. ED411210)

Songer, N. B., & Linn, M. C. (1991). How do students' views of science influence knowledge integration? *Journal of Research in Science Teaching, 28*(9), 761-784.

Stavy, R., & Tirosh, D. (1992). Overgeneralization in mathematics and science: The effect of external similarity. *International Journal of Mathematical Education in Science and Technology, 23*(2), 239-248.

Stuessy, C. L. (1993). Concept to application: Development of an integrated mathematics/science methods course for preservice elementary teachers. *School Science and Mathematics, 93*(2), 55-62.

Stuessy, C. L., & Naizer, G. L. (1996). Reflection and problem solving: Integrating methods of teaching mathematics and science. *School Science and Mathematics, 96*(4), 170-177.

Taylor, J. A. (2001). Using a practical context to encourage conceptual change: An instructional sequence in bicycle science. *School Science and Mathematics, 101*(3), 117-124.

Taylor, M. D. (1991). Sharing teaching ideas: Student participation: An experiment in teaching calculus. *The Mathematics Teacher, 84*(7), 543-546.

Tirosh D., & Stavy, R. (1992). Students' ability to confine their application of knowledge: The case of mathematics and science. *School Science and Mathematics, 92*(7), 353-358.

Tyler-Wood, T. L., Mortenson, M., & Dawn, P. L. (2000). An effective mathematics and science curriculum option for secondary gifted education. *Roeper Review, 22*(4), 266-269.

Underhill, R. G. (1994). Editorial: What is integrated mathematics and science? *School Science and Mathematics, 94*(1), 1.

Underhill, R. G. (1995a). Editorial: Integrate or connect? Changing tactics. *School Science and Mathematics, 95*(1), 337.

Underhill, R. G. (1995b). Editorial: Observations about the scope of 1995 articles. *School Science and Mathematics, 95*(8), 393.

Underhill, R. G. (1995c). Integrating math and science: We need dialogue! *School Science and Mathematics, 95*(5), 225.

Venville, G., Wallace, J., Rennie, L. J., & Malone, J. (1998). The integration of science, mathematics, and technology in a discipline-based culture. *School Science and Mathematics, 98*(6), 294-302.

Watanabe, T., & Huntley, M. A. (1998). Connecting mathematics and science in undergraduate teacher education programs: Faculty voices from the Maryland collaborative for teacher preparation. *School Science and Mathematics, 98*(1), 19-25.

Wesbrook, S. L. (1998). Examining the conceptual organization of students in an integrated algebra and physical science class. *School Science and Mathematics, 98*(2), 84-92.

Wicklein, R. C., & Schell, J. W. (1995). Case studies of multidisciplinary approaches to integrating mathematics, science and technology education. *Journal of Technology Education, 6*(2), 59-76.

Woolnough, J. (2000). How do students learn to apply their mathematical knowledge to interpret graphs in physics? *Research in Science Education, 30*(3), 259-267.

Yamamoto, T. (1998). *A comparison of the quality of integrated freshman-year curriculum for science, engineering and mathematics with a conventional curriculum.* Terre Haute, IN: Indiana State University. (ERIC Document Reproduction Service No. ED436359)

Zuga, K. F. (2000). Technology education as an integrator of science and mathematics. In G. E. Martin (Ed.), *Education for the 21st century a collection of essays* (pp. 223-227). Peoria, IL: Glencoe/McGraw-Hill.

SECTION 4: CURRICULUM-INSTRUCTION [C-I] LITERATURE

Atwater, M. M. (1995). The cross-curricular classroom. *Science Scope, 19*(2), 42-45.

Cognition and Technology Group at Vanderbilt. (1992). The Jasper experiment: An exploration of issues in learning and instructional design. *Educational Technology Research and Development, 40*(1), 65-80.

Cognition and Technology Group at Vanderbilt. (1993b). Toward integrated curricula: Possibilities from anchored instruction. In M. Rabinowitz (Ed.), *Cognitive science foundations of instruction* (pp. 33-55). Hillsdale, NJ: Erlbaum.

Czerniak, C. M., & Penn, L. D. (1996). Crossing the curriculum with frogs. *Science and Children, 33*(5), 28-31, 35.

Kelley, C., Jordan, A., & Roberts, C. (2001). Finding the science in art: An interdisciplinary course linking art, math, and chemistry. *Journal of College Science Teaching, 31*(3), 162-166.

LaPorte, J. E., & Sanders, M. (1993). Integrating technology, science, and mathematics in the middle school. *The Technology Teacher, 52*(6), 17-21.

Layman, J. W., & Krajcik, J. S. (1993). The microcomputer and practical work in science laboratories. *Innovations in Science and Technology Education, 4*, 171-180.

McDonald, J., & Czerniak, C. (1994). Developing interdisciplinary units: Strategies and examples. *School Science and Mathematics, 94*(1), 5-10.

McMahon, M. M., O'Hara, S. P., Holliday, W. G., McCormack, B. B., & Gibson, E. M. (2000). Curriculum with a common thread. *Science and Children, 37*(7), 30-35, 57.

Miller, L. M., & Castellanos, J. (1996). Use of technology for science and mathematics collaborative learning. *School Science and Mathematics, 96*(2), 58-62.

O'Brien, M., & Chalif, D. (1991). *CHEMATH: A learning community in science and math.* Lynnwood, WA: Edmonds Community College. (ERIC Document Reproduction Service No. ED336157)

Piazza, J. A., Scott, M. M., & Carver, E. C. (1994). Thematic webbing and the curriculum standards in the primary grades. *The Arithmetic Teacher, 41*(6), 294-298.

Sanders, M. (1993). Science and technology: A new alliance. *Science Scope, 16*(6), 56-60.

Sanders, M. (1994). Technological problem-solving activities as a means of instruction: The TSM integration program. *School Science and Mathematics, 94*(1), 36-43.

BEST COPY AVAILABLE

Sandmann, A. L., Weber, W. B. Jr., Czerniak, C. M., & Ahern, J. F. (1999). Coming full circuit: An integrated unit plan for intermediate and middle grade students. *Science Activities, 36*(3), 13-20.

Scarborough, J. D. (1993b). PHYS-MA-TECH: Operating strategies, barriers, and attitudes. *The Technology Teacher, 52*(6), 35-38.

Scarborough, J. D., & White, C. (1994). PHYS-MA-TECH: An integrated partnership. *Journal of Technology Education, 5*(2), 31-39.

Smith, E. E., & Westhoff, G. M. (1992). The Taliesin project: Multidisciplinary education and multimedia. *Educational Technology, 32*(1), 15-23.

Thomas, D. A., Johnson, K., & Stevenson, S. (1996). Integrated mathematics, science, and technology: An introduction to scientific visualization. *Journal of Computers in Mathematics and Science Teaching, 15*(3), 267-294.

VanLeuvan, P. (1997). Young women experience mathematics at work in the health professions. *Mathematics Teaching in the Middle School, 3*(3), 198-206.

SECTION 5: CURRICULUM-EVALUATION [C-E] LITERATURE

Beck, R. H., Copa, G. H., & Pease, V. H. (1991). Vocational and academic teachers work together. *Educational Leadership, 49*(2), 29-31.

Deal, D. (1994). A look at project AIMS. *School Science and Mathematics, 94*(1), 11-14.

Sinn, J., Walthour, S., & Haren, D. (1993). Technology based mathematics and science applications: One approach. *The Technology Teacher, 53*(1), 29-35.

Sinn, J., Walthour, S., & Haren, D. (1995). Technology-based math and science applications. *The Technology Teacher, 55*(2), 16-24.

BIBLIOGRAPHY (VOLUME 1): OMITTED LITERATURE

Boggess, G. W. (1981). *Integrated Science-Mathematics Education Project (ISMEP): Set of modules.* Washington, DC: National Science Foundation. (ERIC Document Reproduction Service No. ED210164) [C-I]

Brasell, H. (1987). The effect of real-time laboratory graphing on learning graphic representations of distance and velocity. *Journal of Research in Science Teaching,* 24(4), 385-395. **[R]**

Bray, E. C. (1969). MINNEMAST. An elementary math-science program. *School Science and Mathematics, 69*(6), 541-547. **[C]**

Center for Mathematics, Science, and Technology Education. (1988). IMaST at a glance: Integrated mathematics, science, and technology. Normal, IL: Center for Mathematics, Science, and Technology, Illinois State University. (ERIC Document Reproduction Service No. ED422184) **[C-I]**

Kapisovsky, P. M. (1990). Science and math: Vitality through technology. *Media and Methods, 27*(1), 59-61. **[I]**

Mills, R. E. (1983). Miracle mileage versus the conservation of energy. *The Physics Teacher, 21*(1), 45-46. **[I]**

Mokros, J. R., & Tinker, R. F. (1987). The impact of microcomputer-based labs on children's ability to interpret graphs. *Journal of Research in Science Teaching,* 24(4), 369-383. **[R]**

Morse, R. A. (1988). Determining the effect of tire pressure on rolling resistance. *The Physics Teacher, 26*(4), 225. **[I]**

Perkins, D. N., & Simmons, R. (1988). Patterns of misunderstanding: An integrative model for science, math, and programming. *Review of Educational Research, 58*(3), 303-326. **[R]**

Stuessy, C. L., & Rowland, P. M. (1989). Advantages of micro-based labs: Electronic data acquisition, computerized graphing, or both? *Journal of Computers in Mathematics and Science Teaching, 8*(3), 18-21. **[R]**

Thornton, R. K. (1985). *Tools for scientific thinking: Microcomputer-based laboratories for naive science learners.* Paper presented at the National Educational Computing Conference, San Diego, CA. (ERIC Document Reproduction Service No. ED264130) **[R]**

Tobin, K., Briscoe, C., & Holman, J. R. (1990). Overcoming constraints in effective elementary science teaching. *Science Education, 74*(4), 409-420. **[R]**

Young, S. L. (1990a). IDEAS. North American dinosaur data sheet. *The Arithmetic Teacher, 38*(1), 23-33. **[I]**

Young, S. L. (1990b). IDEAS. What makes a ball bounce higher than other balls? *The Arithmetic Teacher, 38*(3), 23-25, 29-30. **[I]**

BIBLIOGRAPHY(VOLUME 2): ALPHABETICAL LISTING OF LITERATURE

Aghadiuno, M.C.K. (1992). Mathematics: History, philosophy and applications to science. *International Journal of Mathematical Education in Science and Technology, 23*(5), 683-690. **[C]**

Aiello-Hatchman, J., & Duren, P. E. (1991). SSMILes. It's not all garbage! *School Science and Mathematics, 91*(6), 272-275. **[I]**

Alcaro, P. C., Alston, A. S., & Katims, N. (2000). Fractions attack: Children thinking and talking mathematically. *Teaching Children Mathematics, 6*(9), 562-567. **[I]**

Anderson, A. (1993). A means to an end. *Mathematics Teaching, 142*, 34-37. **[I]**

Anderson, A. (1994). Mathematics in context: Measurement, packaging and caring for our environment. *School Science and Mathematics, 94*(3), 146-150. **[I]**

Anderson, E. J. (1994). Simplifying significant figures. *The Science Teacher, 61*(7), 31-33. **[I]**

Angel, S. A., & LaLonde, D. E. (1998). Science success strategies: An interdisciplinary course for improving science and mathematics education. *Journal of Chemical Education, 75*(11), 1437-1441. **[R]**

An-Guo, F. (1992). The graphical solution. *The Physics Teacher, 30*(6), 378-379. **[I]**

Anthony, J. L. (1994). Race car rally. Make a pit stop to tune up science learning. *Science and Children, 31*(5), 26-29. **[I]**

Atwater, M. M. (1995). The cross-curricular classroom. *Science Scope, 19*(2), 42-45. **[C-I]**

Austin, J. D., Converse, R. E., Sass, R. L., & Tomlins, R. (1992). Coordinating secondary school science and mathematics. *School Science and Mathematics, 92*(2), 64-68. **[R]**

Austin, J. D., Hirstein, J., & Walen, S. (1997). Integrated mathematics interfaced with science. *School Science and Mathematics, 97*(1), 45-49. **[R]**

Baartmans, B. G., & Sorby, S. A. (1996). Making connections: Spatial thinking and engineering drawings. *The Mathematics Teacher, 89*(4), 348-357. **[I]**

Baker, W. P., & Thomas, C. L. (1998). Gummy bear genetics. *The Science Teacher, 65*(8), 25-27. **[I]**

Barrow, L. H., Burchett, B. M., Germann, P. J., & Callison, P. (1994). SSMILes. Get on track. *School Science and Mathematics, 94*(6), 326-327. **[I]**

BEST COPY AVAILABLE

Bartels, B. H. (1998). Truss(t)ing triangles. *Mathematics Teaching in the Middle School, 3*(6), 394-396. **[I]**

Barton, R. (1993). Computers and practical science: Why isn't everyone doing it? *School Science Review, 75*(271), 75-80. **[C]**

Basista, B., Tomlin, J., Pennington, K., & Pugh, D. (2001). Inquiry-based integrated science and mathematics professional development program. *Education, 121*(3), 615-624. **[R]**

Beck, R. H., Copa, G. H., & Pease, V. H. (1991). Vocational and academic teachers work together. *Educational Leadership, 49*(2), 29-31. **[C-E]**

Beckmann, C., & Rozanski, K. (1999). Graphs in real time. *Mathematics Teaching in the Middle School, 5*(2), 92-99. **[I]**

Belsky, N. A. (1998). Mission mathematics by the month. *Teaching Children Mathematics, 91*(3), 408-409. **[I]**

Bennett, B. K. (1996). Now and then: The long-distance doctor. *Mathematics Teaching in the Middle School, 1*(10), 802-806. **[I]**

Beougher, C. (1994). Making connections with teddy bears. *The Arithmetic Teacher, 41*(7), 354-362. **[I]**

Berg, C. A., & Smith, P. (1994). Assessing students' abilities to construct and interpret line graphs: Disparities between multiple choice and free-response instruments. *Science Education, 78*(6), 527-554. **[R]**

Berlin, D. F. (1994). The integration of science and mathematics education: Highlights from the NSF/SSMA Wingspread Conference plenary papers. *School Science and Mathematics, 94*(1), 2-4. **[R]**

Berlin, D. F., & Hillen, J. A. (1994). Making connections in math and science: Identifying student outcomes. *School Science and Mathematics, 94*(6), 283-290. **[R]**

Berlin, D. F., & White, A. L. (1991, September). *A Network for Integrated Science Mathematics Teaching and Learning* (NCSTL Monograph Series 2). Columbus, OH: The National Center for Science Teaching and Learning. (ERIC Document Reproduction Service No. ED349167) **[R]**

Berlin, D. F., & White, A. L. (1992). Report from the NSF/SSMA Wingspread Conference: A Network for Integrated Science and Mathematics Teaching and Learning. *School Science and Mathematics, 92*(6), 340-342. **[R]**

Berlin, D. F., & White, A. L. (1993). *Integration of science and mathematics: What parents can do*. Columbus, OH: The National Center for Science Teaching and Learning. **[I]**

Berlin, D. F., & White, A. L. (1994). The Berlin-White Integrated Science and Mathematics Model. *School Science and Mathematics, 94*(1), 2-4. **[R]**

Berlin, D. F., & White, A. L. (1995a). Connecting school science and mathematics. In P. A. House & A. F. Coxford (Eds.), *1995 National Council of Teachers of Mathematics yearbook. Connecting mathematics across the curriculum* (pp. 22-33). Reston, VA: National Council of Teachers of Mathematics. **[R]**

Berlin, D. F., & White, A. L. (1995b). Using technology in assessing integrated science and mathematics learning. *Journal of Science Education and Technology, 4*(1), 47-56. **[R]**

Berlin, D. F., & White, A. L. (1998). Integrated science and mathematics education: Evolution and implications of a theoretical model. In B. J. Fraser & K. G. Tobin (Eds.), *International handbook of science education* (pp. 499-512). Dordrecht, Netherlands: Kluwer Academic Publishers. **[R]**

Berlin, D. F., & White, A. L. (2001). Science and mathematics together: Implementing a theoretical model. *Science Educator, 10*(1), 50-57. **[R]**

Berr, S. (1994). Experiencing the eclipse. *The Science Teacher, 61*(4), 29-33. **[I]**

Biehl, L. C. (1998). Forest fires, oil spills, and fractal geometry: An investigation in two parts. Part 1: Cellular automata and modeling natural phenomena. *The Mathematics Teacher, 91*(8), 682-690, 696-698. **[I]**

Biehl, L. C. (1999). Forest fires, oil spills, and fractal geometry: An investigation in two parts. Part 2: Using fractal complexity to analyze mathematical models. *The Mathematics Teacher, 92*(2), 128-130, 136-139. **[I]**

Bisbee, G. D., & Conway, D. M. (1999). Studying proportions using the capture-recapture method. *The Mathematics Teacher, 92*(3), 215-218. **[I]**

Blanchard, T. P. (1993). Science on display: The cosmic clock. *Science Scope, 17*(2), 37. **[I]**

Blomquist, S. L. (1993). SSMILes. Metric volume in science and mathematics instruction. *School Science and Mathematics, 93*(8), 440-444. **[I]**

Blomquist, S. L. (1996). SSMILes. Reaching for the stars. *School Science and Mathematics, 96*(3), 158-163. **[I]**

BEST COPY AVAILABLE

Bogard, L. D. (1993). Endangered species alert. *Science Scope, 16*(6), 46-48. **[I]**

Borlaug, V. A. (1993). From algebra to calculus - A Tonka toy truck does the trick. *The Mathematics Teacher, 86*(4), 282-287. **[I]**

Bosch, W., Sizoo, J., Curtis, A., Klein, S., Micale, C., & Lin, E. (1997). Fishy formulas. *The Mathematics Teacher, 90*(8), 666-671. **[I]**

Brasell, H. M., & Rowe, M. B. (1993). Graphing skills among high school physics students. *School Science and Mathematics, 93*(2), 63-69. **[R]**

Brekke, S. E. (1999). A mathematical physics for all students. *The Physics Teacher, 37*(9), 557. **[I]**

Brody, M. J., & deOnis, A. (2001). Fossil forecasting. *The Science Teacher, 68*(9), 20-25. **[I]**

Browning, C. A., & Channell, D. E. (1992). A "handy" database activity for the middle school classroom. *The Arithmetic Teacher, 40*(4), 235-238. **[I]**

Brueningsen, C., & Krawiec, W. (1993). Planets and pucks. *The Science Teacher, 60*(7), 39-41. **[I]**

Brunner, R. B., & Brunner, C. E. (1994). How much does camouflage help? *The Mathematics Teacher, 87*(9), 676-681. **[I]**

Brutlag, D., & Maples, C. (1992). Making connections: Beyond the surface. *The Mathematics Teacher, 85*(3), 230-235. **[I]**

Burghardt, B., & Heilman, G. (1994). Water matters. *Teaching Children Mathematics, 1*(1), 24-25. **[I]**

Caples, L. G. (1992). Squeal those tires! Automobile-accident reconstruction. *The Mathematics Teacher, 85*(10), 56-61. **[I]**

Cavalli-Sforza, V., Weiner, A. W., & Lesgold, A. M. (1994). Software support for students engaging in scientific activity and scientific controversy. *Science Education, 78*(6), 577-599. **[I]**

Cave, L. (1997). Super-jumbo jet: An airborne village. *Mathematics Teaching in the Middle School, 3*(2), 128-131. **[I]**

Chessin, D. A., & Shaw, J. M. (1994). IDEAS. Recycling. *The Arithmetic Teacher, 41*(9), 534-543. **[I]**

Chia, D. T. (1998). Weather mathematics: Integrating science and mathematics. *Teaching Children Mathematics, 5*(1), 19-22. **[I]**

Christensen, A., & Christian, B. (1997). Dealing with data. *The Science Teacher, 64*(6), 38-41. **[I]**

Clarke, D. (1993). Watching your weight. *The Mathematics Teacher, 86*(5), 358-359. **[I]**

Clason, R., & Frank, M. (1994). Assembly activities: Symmetries and quasicrystal patterns. *School Science and Mathematics, 94*(7), 381-386. **[I]**

Clason, R., Peters, W., & Frank, M. (1993). Quasicrystals and the penrose patterns: A geometry activity with a scientific application. *School Science and Mathematics*, 93(7), 344-350. **[I]**

Cleland, J. V., Wetzel, K. A., Zambo, R., Buss, R. R., & Rillero, P. (1999). Science integrated with mathematics using language arts and technology: A model for collaborative professional development. *Journal of Computers in Mathematics and Science Teaching, 18*(2), 157-172. **[R]**

Clemmitt, S. (1996). Accessible internet data. *The Science Teacher, 63*(3), 48-50. **[I]**

Cognition and Technology Group at Vanderbilt. (1992). The Jasper experiment: An exploration of issues in learning and instructional design. *Educational Technology Research and Development, 40*(1), 65-80. **[C-I]**

Cognition and Technology Group at Vanderbilt. (1993a). The Jasper experiment: Using video to furnish real-world problem-solving contexts. *The Arithmetic Teacher, 40*(8), 474-478. **[I]**

Cognition and Technology Group at Vanderbilt. (1993b). Toward integrated curricula: Possibilities from anchored instruction. In M. Rabinowitz (Ed.), *Cognitive science foundations of instruction* (pp. 33-55). Hillsdale, NJ: Erlbaum. **[C-I]**

Collins, L. T. (1994). Osmosis in potato cells. *The Science Teacher, 61*(4), 48-49. **[I]**

Conte, A. E., & Weber, R. E. (1999). Is technology the best hope for teaching students about mathematics and science? *The Technology Teacher, 59*(1), 19-23. **[I]**

Corner, R. C., & Corner, T. R. (1994). Chi-square analysis. *The Science Teacher, 61*(4), 44-47. **[I]**

Cox, P., & Bridges, L. (1999). Calculating human horsepower. *The Mathematics Teacher, 92*(3), 225-228. **[I]**

Crippen, K. J., & Curtright, R. D. (1998). Modeling nuclear decay: A point of integration between chemistry and mathematics. *Journal of Chemical Education, 75*(11), 1434-1436. **[I]**

Crippen, K. J., Curtright, R. D., & Brooks, D. W. (2000). Mole mapping: Using a graphing calculator as a tool for solving mole problems. *The Science Teacher, 67*(7), 36-39. **[I]**

Crouse, R. J., & Slover, C. W. (1993). Mathematics and medical indexes: A life-saving connection. *The Mathematics Teacher, 86*(8), 624-626. **[I]**

Czerniak, C. M. (1993). The Jurassic spark. *Science and Children, 31*(2), 18-22. **[I]**

Czerniak, C. M. (1994). Potpourri: The one-hour science fair. *Science Scope, 17*(5), 24-25. **[I]**

Czerniak, C. M., & McDonald, J. (1993). Shark attack. *Science Scope, 17*(2), 16-20. **[I]**

Czerniak, C. M., & Penn, L. D. (1996). Crossing the curriculum with frogs. *Science and Children, 33*(5), 28-31, 35. **[C-I]**

Czerniak, C. M., Weber, W. B., Jr., Sandmann, A., & Ahern, J. (1999). A literature review of science and mathematics integration. *School Science and Mathematics, 99*(8), 421-430. **[R]**

D'Agostino, J. B., Kalin-Miller, M., Keegan, M., Schiller, D., & Freeman, S. (1994). Dancing for food: The language of the honeybees. *Science and Children, 31*(8), 15-17, 50. **[I]**

Dance, R. A., & Sandefur, J. T. (1997). Approaching the speed of light with class. *The Mathematics Teacher, 90*(4), 314-319. **[I]**

Daugherty, M. K., & Wicklein, R. C. (1993). Mathematics, science, and technology teachers' perceptions of technology education. *Journal of Technology Education, 4*(2), 30-45. **[R]**

Davison, D. M., Miller, K. W., & Metheny, D. L. (1995). What does integration of science and mathematics really mean? *School Science and Mathematics, 95*(5), 226-230. **[R]**

Deal, D. (1994). A look at project AIMS. *School Science and Mathematics, 94*(1), 11-14. **[C-E]**

Deeds, D. G., Allen, C. S., Callen, B. W., & Wood, M. D. (2001). A new paradigm in integrated math and science courses. *Journal of College Science Teaching, 30*(3), 272-278. **[C]**

Deeds, D. G., Wood, M. D., Callen, B. W., & Allen, C. S. (1999). Contemporary student attitudes about mathematics, science, and technology. *Journal of College Science Teaching, 29*(2), 86-92. **[R]**

De-Jong, M. L. (1993). Graphing electric potential. *The Physics Teacher, 31*(5), 270-272. **[I]**

DelForge, C., DelForge, L., & DelForge, C. (1993). *Integrating aerospace. Science Scope, 17*(3), 41-44. **[I]**

Demana, F., & Waits, B. K. (1993). The particle-motion problem. *The Mathematics Teacher, 86*(4), 288-292. **[I]**

Dengerud-Au, M. (2000). Strength of wood beams: An engineering application. *The Mathematics Teacher, 93*(7), 544-549. **[I]**

Dion, G. S., & Fetta, I. B. (1996). Everybody talks about it! Weather investigations. *The Mathematics Teacher, 89*(2), 160-165. **[I]**

Dispezio, M. A. (1993). Eratosthenes and the earth. *Science Scope, 16*(6), 14-17. **[I]**

Donivan, M. (1993). A dynamic duo takes on science. *Science and Children, 31*(2), 29-32. **[I]**

Drake, S. M. (1991). How our team dissolved the boundaries. *Educational Leadership, 49*(2), 20-22. **[R]**

Dujari, A., & Bosse, M. J. (2000). Measuring molecules. *The Science Teacher, 67*(5), 32-35. **[I]**

Dunn, J. W., & Barbanel, J. (2000). One model for an integrated math/physics course focusing on electricity and magnetism and related calculus topics. *American Journal of Physics, 68*(8), 749-757. **[C]**

Eagles, C. (1994). Mad for metric measure. *Science and Children, 31*(4), 23-25, 59. **[I]**

Easterday, K. E., & Bass, D. T. (1993a). SSMILes. Viewing weather conditions with a mathematical eye (humidity and pressure as part of a function). *School Science and Mathematics, 93*(3), 160-165. **[I]**

Easterday, K. E., & Bass, D. T. (1993b). Using environmental issues to integrate science and mathematics. *School Science and Mathematics, 93*(5), 234-236. **[I]**

Eckhaus, A., & Wolfe, R. (1997). Gathering and interpreting data. *Science Scope, 21*(4), 44-45. **[I]**

BEST COPY AVAILABLE

Edwards, T. (1995). Building mathematical models of simple harmonic and damped motion. *The Mathematics Teacher, 88*(1), 18-22. **[I]**

Edwards, T. G. (1995). Students as researchers: An inclined-plane activity. *Mathematics Teaching in the Middle School, 1*(7), 532-535. **[I]**

Eichman, J. C., & Brown, J. A. (1994). Global warming? *The Science Teacher, 61*(4), 24-28. **[I]**

Ellenburg, R. (1993). New and improved. *Learning, 22*(1), 45. **[I]**

Elliott, B., Oty, K., McArthur, J., & Clark, B. (2001). The effect of an interdisciplinary algebra/science course on students' problem solving skills, critical thinking skills and attitudes towards mathematics. *International Journal of Mathematical Education in Science and Technology, 32*(6), 811-816. **[R]**

Else, J. (1993). Structures: A cross-curricular theme. *Mathematics in School, 22*(3), 30-33. **[C]**

Emenaker, C. (2000). SSMILes. Egging your students on. *School Science and Mathematics, 100*(5), 260-269. **[I]**

Emenaker, C. (2001). Just thinkin' of the rain. *The Mathematics Teacher, 94*(4), 272-276. **[I]**

Engelland, H. (1994). Catapulting, bringing the Middle Ages to the middle level classroom. *Science Scope, 17*(5), 31-36. **[I]**

Evans, H. E., II. (1996). Ray tracing with hinged mirrors. *The Physics Teacher, 34*(5), 314-315. **[I]**

Evans, J. H. (1999). Sorting out seeds. *Science Scope, 22*(7), 18-21. **[I]**

Farenga, S. J., Joyce, B. A., & Ness, D. (2001a). The science and mathematics of nature. *Science Scope, 25*(2), 10-13. **[I]**

Farenga, S. J., Joyce, B. A., & Ness, D. (2001b). Where do we go next? *Science Scope, 24*(5), 48-51. **[I]**

Farnsworth, D. L. (1991). Sharing teaching ideas: Introducing probability. *The Mathematics Teacher, 84*(7), 542-543. **[I]**

Ferrini-Mundy, J. (1998). Learning from the math standards. *The Science Teacher, 65*(9), 27-29. **[C]**

Fiore, G. (2000). An out-of-math experience: Einstein, relativity, and the developmental mathematics student. *The Mathematics Teacher, 93*(3), 194-199. **[I]**

Fishman, J. (1993). Analyzing energy and resource problems: An interdisciplinary approach with mathematical modeling. *The Mathematics Teacher, 86*(8), 628-633. **[I]**

Flores, A. (1992). Mathematical connections with a spirography. *The Mathematics Teacher, 85*(2), 129-137. **[I]**

Flores, A. (1995). Connections in proportional reasoning: Levers, arithmetic means, mixtures, batting averages, and speeds. *School Science and Mathematics, 95*(8), 423-430. **[I]**

Flores, A., & Birge, L. (1998). SSMILes. Ancestry of humans and bees. *School Science and Mathematics, 98*(2), 99-103. **[I]**

Flores, A., & Guest, A. (1997). SSMILes. Fibonacci in the forest. *School Science and Mathematics, 97*(7), 388-392. **[I]**

Flores, A., & Perkins, I. (1996). SSMILes. Tin-can ice cream. *School Science and Mathematics, 96*(1), 46-49. **[I]**

Flores, A., & Turner, E. E. (2001). SSMILes. Inclined planes and motion detectors: A study of acceleration. *School Science and Mathematics, 101*(3), 154-161. **[I]**

Flournoy, B. E., Cook-Bax, J. E., & Harris, L. (2001). The science-mathematics connection: Using technology in an interdisciplinary module. *The Science Teacher, 68*(6), 63-66. **[I]**

Foat, J., & Siegel, P. (1994). Transcendental measurementation. *The Physics Teacher, 32*(4), 231-233. **[I]**

Forkey, C. (1996). Data collecting calculators. *The Science Teacher, 63*(3), 18-20. **[I]**

Foss, D. H., & Pinchback, C. L. (1998). An interdisciplinary approach to science, mathematics, and reading: Learning as children learn. *School Science and Mathematics, 98*(98), 149-155. **[R]**

Francis, R. G., Hill, D. M., & Redden, M. G. (1991). Mathematics and science: A shared learning cycle and a common learning environment. *School Science and Mathematics, 91*(8), 339-343. **[R]**

Francis, R., & Underhill, R. G. (1996). A procedure for integrating math and science units. *School Science and Mathematics, 96*(3), 114-119. **[C]**

Funkhouser, K., & Deslich, B. J. (2000). Integrating forensic science. *The Science Teacher, 67*(6), 32-35. **[I]**

Furner, J. M., & Ramirez, M. (1999). Making connections: Using GIS to integrate mathematics and science. *TechTrends, 43*(4), 34-39. **[I]**

Gampel, M. B. (1993). Subterranean city. *Science Scope, 16*(6), 64-66. **[I]**

Gardner, H., & Boix-Mansilla, V. (1994). Teaching for understanding - Within and across the disciplines. *Educational Leadership, 51*(5), 14-18. **[C]**

Genoni, M. (1994). Potpourri: Timing televiewing. *Science Scope, 17*(5), 26. **[I]**

Giberson, K., & Brown, L. (1997). Hello out there: Coding messages for extraterrestrials is a prime activity. *The Science Teacher, 64*(8), 25-27. **[I]**

Glaister, P. (1993). Graphing pH curves. *School Science Review, 75*(271), 100-101. **[I]**

Goates, W. (2000). Lavosier measures with polymers. *Science Scope, 24*(1), 30-33. **[I]**

Good, R. (1991). Editorial: Research on science-mathematics connections. *Journal of Research in Science Teaching, 28*(2), 109. **[R]**

Haigh, W., & Rehfeld, D. (1995). Integration of secondary mathematics and science methods courses: A model. *School Science and Mathematics, 95*(5), 240-247. **[R]**

Hajda, J., & Hajda, L. B. (1994). Sparking interest in electricity. *Science Scope, 18*(3), 36-39. **[I]**

Hale, P. (2000). Kinematics and graphs: Students' difficulties and CBLs. *The Mathematics Teacher, 93*(5), 414-417. **[R]**

Hamm, M. (1992). Achieving scientific literacy through a curriculum connected with mathematics and technology. *School Science and Mathematics, 92*(1), 6-9. **[C]**

Hammond, M. (1993a). Ramps. *Micromath, 9*(1), 7-9. **[I]**

Hammond, M. (1993b). What does cross-curricular mean? *Mathematics in School, 22*(2), 14-15. **[C]**

Haug, M. (1998). Up the creek with a paddle. *The Mathematics Teacher, 91*(6), 456-460. **[I]**

Hedgepeth, D. J. (1994). SSMILes. Using models to teach about remote sensing and image processing. *School Science and Mathematics, 94*(1), 46-51. **[I]**

Hedgepeth, D. J. (1995). SSMILes. Measuring the nutrient tolerance of algae. *School Science and Mathematics, 95*(2), 102-107. **[I]**

Helisek, H., & Pratt, D. (1994). Project reconstruct. *Science and Children, 31*(7), 25-28. **[I]**

Helme, B. D. (1995). Mathematical connections: Proportions and modeling in the solar system. *Mathematics Teaching in the Middle School, 1*(6), 488-489. **[I]**

Hendrix-Martin, E. (1997). Students use their bodies to measure animals. *Teaching Children Mathematics, 3*(8), 426-430. **[I]**

Hernandez, N. G., & Milson, J. L. (1993). SSMILes. The best Lindy 500 racer! *School Science and Mathematics, 93*(7), 373-384. **[I]**

Hiatt, E. L., & Covington, J. (Eds.). (1991). *Curriculum.* Austin, TX: Texas Education Agency, Division of Gifted/Talented Education. (ERIC Document Reproduction Service No. ED340163) **[C]**

Hildreth, D. P., & Matthews, C. E. (1997). Get a kick out of physics. *The Science Teacher, 64*(9), 34-36. **[I]**

Hines, C. (1992). Science notes: A student guide to understanding reacting mass calculations. *School Science Review, 74*(266), 85-86. **[I]**

Hoffman, K. M., & Stage, E. K. (1993). Science for all: Getting it right for the 21st century. *Educational Leadership, 50*(5), 27-31. **[C]**

Holden, C. (1993). Computer networks bring 'real science' to the schools. *Science, 261*, 980-981. **[I]**

Hopkins, M. H., & Gard, D. M. (1992). IDEAS. Space nutrition. *The Arithmetic Teacher, 40*(2), 95-96, 100. **[I]**

Huntley, M. A. (1998). Design and implementation of a framework for defining integrated mathematics and science education. *School Science and Mathematics, 98*(6), 320-327. **[R]**

Huntley, M. A. (1999). Theoretical and empirical investigations of integrated mathematics and science education in the middle grades with implications for teacher education. *Journal of Teacher Education, 50*(1), 57-67. **[R]**

Hurd, P. D. (1991). Why we must transform science education. *Educational Leadership, 49*(2), 33-35. **[C]**

Hurley, M. M. (2001). Reviewing integrated science and mathematics: The search for evidence and definitions from new perspectives. *School Science and Mathematics, 101*(5), 259-268. **[I]**

Iijima, R., & Rubeck, M. (1998). Breakfast density. *Science and Children, 36*(2), 22-25. **[I]**

Indiana State Department of Education. (1991). *Save our streams and waterways*. Indianapolis: Center for School Improvement and Performance. (ERIC Document Reproduction Service No. ED338509) **[I]**

Inman, D. (1997). Water rockets and indirect measurement. *Science Scope, 20*(7), 22-23. **[I]**

Iovinelli, R. (1997). Activities for the logistical growth model; or, invasion of the killer moths. *The Mathematics Teacher, 90*(7), 588-593. **[I]**

Isaacs, A., Wagreich, P., & Gartzman, M. (1997). The quest for integration: School mathematics and science. *American Journal of Education, 106*(1), 179-206. **[R]**

Isayev, D. A. (1993). A Soviet approach: Integrated science. *Science Scope, 16*(5), 50-55. **[C]**

Jabon, D., Nord, G., Wilson, B. W., Coffman, P., & Nord, J. (1996). Medical applications of systems of linear equations. *The Mathematics Teacher, 89*(5), 398-402. **[I]**

Jacobs, H. H. (1991). Planning for curriculum integration. *Educational Leadership, 49*(2), 27-28. **[C]**

Jaffe, D., Griffin, D., & Ricker, J. (1997). Analyzing cigarette smoke: Students investigate the tar and carbon monoxide content of cigarettes. *The Science Teacher, 64*(9), 29-33. **[I]**

James, R. K., Lamb, C. E., Householder, D. L., & Bailey, M. A. (2000). Integrating science, mathematics, and technology in middle school technology-rich environments: A study of implementation and change. *School Science and Mathematics, 100*(1), 27-33. **[R]**

Jensen, R. S., Gannaway, S. B., & Sloan, M. P. (1994). *Integrated mathematics and science courses for preservice teachers, K-8 or 4-8*. Washington, DC: Eisenhower Program for Mathematics and Science Education. (ERIC Document Reproduction Service No. ED384520) **[C]**

Johnson, A. (2000). The Jurassic classroom. *The Mathematics Teacher, 93*(2), 102-105, 109-113. **[I]**

Johnson, H. A., & Jett, P. (1993). Making the connection. *Science Scope*, *16*(6), 4-6. **[C]**

Johnson, W. W. (1994). Teaching mathematical and scientific concepts through the use of a pneumatic arm wrestling machine. *The Technology Teacher, 53*(6), 15-17. **[I]**

Jones, G. A., Rich, B. S., & Day, R. (1996). The assessment of a complex problem: The bungee jump project. *School Science and Mathematics, 96*(2), 68-74. **[I]**

Jones, R. (1995). How big, how tall? The scaling principle answers. *Science Scope, 19*(2), 22-26. **[I]**

Jones, R. C. (1994). How much is a million? *Science Scope, 18*(2), 28-31. **[I]**

Jorgensen, B. (1996). Hamster math: Authentic experiences in data collection. *Teaching Children Mathematics*, *2*(6) 336-339. **[I]**

Keller, J. D., & Berry, K. A. (2001). Burning questions. *Science Scope, 24*(7), 28-32. **[I]**

Keller, J. D., & Brickman, B. (1998). The ball Olympics: Up and down, all around. *Science and Children, 32*(2), 26-30, 56. **[I]**

Kelley, C., Jordan, A., & Roberts, C. (2001). Finding the science in art: An interdisciplinary course linking art, math, and chemistry. *Journal of College Science Teaching, 31*(3), 162-166. **[C-I]**

Kennedy, J. B. (1996). An interest in radioactivity. *The Mathematics Teacher, 89*(3), 209-214, 228-230. **[I]**

Kim, H. (1997). Angled sunshine, seasons, and solar energy. *The Mathematics Teacher, 90*(7), 528-532. **[I]**

Kleiman, G. M. (1991). Mathematics across the curriculum. *Educational Leadership, 49*(2), 48-51. **[C]**

Kober, N. (1991). How can math instruction be better integrated with the rest of the curriculum? In N. Kober, *EdTalk. What we know about mathematics teaching and learning* (p. 13). Washington, DC: Council for Educational Development and Research. **[C]**

Koch, H. (1995). Simplifying stoichiometry. *The Science Teacher, 62*(8), 36-39. **[I]**

Koenig, D., & Kuznik, F. (1994). USA TODAY: Connecting science and mathematics principles to the daily news. *School Science and Mathematics, 94*(1), 15-17. **[I]**

Kotar, M., Guenter, C. E., Metzger, D., & Overholt, J. L. (1998). Curriculum integration: A teacher education model. *Science and Children, 35*(5), 40-43. **[C]**

BEST COPY AVAILABLE

Lamb, J., Jr. (1991). A mathematical model of the great solar eclipse of 1991. *School Science and Mathematics, 91*(7), 293-296. **[I]**

Lamphere, P. (1995). Zoo mania. *Teaching Children Mathematics, 1*(9), 556-560. **[I]**

Langdon, R. J. (1995). Dig into mining activities. *Science Scope, 19*(1), 28-33. **[I]**

LaPorte, J. E., & Sanders, M. (1993). Integrating technology, science, and mathematics in the middle school. *The Technology Teacher, 52*(6), 17-21. **[C-I]**

Laurillard, D. (1992). Learning through collaborative computer simulations. *British Journal of Educational Technology, 23*(3), 164-171. **[R]**

Layman, J. W., & Krajcik, J. S. (1993). The microcomputer and practical work in science laboratories. *Innovations in Science and Technology Education, 4*, 171-180. **[C-I]**

LeBeau, S. (1997). Mathematics and the environment. *Teaching Children Mathematics, 3*(8), 440-441. **[I]**

Lebofsky, L. A., & Lebofsky, N. R. (1998). Mapping mars. *Science Scope, 22*(1), 33-35. **[I]**

Lederman, N. G., & Niess, M. L. (1997). Integrated, interdisciplinary, or thematic instruction? Is this a question or is it questionable semantics? *School Science and Mathematics, 97*(2), 57-58. **[R]**

Lee, C. (1997). The integration of math and science via centroids. *School Science and Mathematics, 97*(4), 200-205. **[I]**

Lee, P. (1997). *A first year evaluation study of integrated math and integrated science curricular programs in an inner city high school*. San Francisco Bay Area, CA. (ERIC Document Reproduction Service No. ED415092) **[R]**

Lehman, J. R. (1991). SSMILes. Measurement: The human body. *School Science and Mathematics, 91*(7), 325-327. **[I]**

Lehman, J. R. (1994a). Integrating science and mathematics: Perceptions of preservice and practicing elementary teachers. *School Science and Mathematics, 94*(2), 58-64. **[R]**

Lehman, J. R. (1994b). Measure up to science. *Science and Children, 31*(5), 30-31. **[I]**

Lehman, J. R., & Kandl, T. M. (1995). SSMILes. Popcorn investigations for integrating mathematics, science, and technology. *School Science and Mathematics, 95*(1), 46-49. **[I]**

Lehrer, R., & Schauble, L. (1998). Reasoning about structure and function: Children's conceptions of gears. *Journal of Research in Science Teaching, 35*(1), 3-25. **[R]**

Leonard, J. (2000). Let's talk about the weather: Lessons learned in facilitating mathematical discourse. *Mathematics Teaching in the Middle School, 5*(8), 518-523. **[R]**

Leonhardt, N. A. (1998). *An ecological system curriculum: An integrated MST approach to environmental science education.* Paper presented at the International Consortium for Research in Science and Mathematics Education, Port of Spain, Trinidad. (ERIC Document Reproduction Service No. ED433995) **[R]**

Levine, Z. H. (1993). How to measure the radius of the Earth on your beach vacation. *The Physics Teacher, 31*(7), 440-441. **[I]**

Lifer, S. (1995, May). What size is your car engine? A graphing calculator problem. *Ohio Journal of School Mathematics,* 31, 34-39. **[I]**

Lindgren, J., & Cushall, M. (2001). You can always tell a dancer by her feet. *Science Scope, 24*(4), 12-16. **[I]**

Loepp, F. L. (1999). Models of curriculum integration. *The Journal of Technology Studies, 25*(2), 21-25. **[R]**

Lonning, R. A., & DeFranco, T. C. (1997). Integration of science and mathematics: A theoretical model. *School Science and Mathematics, 97*(4), 212-215. **[R]**

Lonning, R. A., DeFranco, T. C., & Weinland, T. P. (1998). Development of theme-based, interdisciplinary, integrated curriculum: A theoretical model. *School Science and Mathematics, 98*(6), 312-318. **[R]**

March, R. H. (1993). The mystical 'Quadratic formula'. *The Physics Teacher, 31*(3), 147. **[I]**

Marks, S. K., Vitek, J. D., & Allen, K. P. (1996). Remote sensing: Analyzing satellite images to create higher order thinking skills. *The Science Teacher, 63*(3), 28-31. **[I]**

Marsh, P., & Ripa, M. (1998). A sweet start to science. *Science Scope, 22*(1), 18-21. **[I]**

Matthews, C. E., McDuffie, K., Campbell, T., Walling, J., & Craig, J. (1999). Planetary paths. *Science Scope, 22*(8), 10-14. **[I]**

May, K. (1994). The case of the cavity. *Science Scope, 18*(2), 23-27. **[I]**

Mayotte, G. A. (1994). An activity that measures up. *Science Scope, 18*(3), 45. **[I]**

BEST COPY AVAILABLE

McBride, J. W., & Silverman, F. L. (1991). Integrating elementary/middle school science and mathematics. *School Science and Mathematics, 91*(7), 285-292. **[C]**

McDonald, J., & Czerniak, C. (1994). Developing interdisciplinary units: Strategies and examples. *School Science and Mathematics, 94*(1), 5-10. **[C-I]**

McDonald, J., & Czerniak, C. (1998). SSMILes. Scaling sharks. *School Science and Mathematics, 98*(7), 397-399. **[I]**

McDuffie, T. F., & Palmer, A. (2000). How big are raindrops? *The Science Teacher, 67*(2), 46-50. **[I]**

McGehee, J. J. (2001). Developing interdisciplinary units: A strategy based on problem solving. *School Science and Mathematics, 101*(7), 380-389. **[C]**

McGlone, C., & Nieberle, G. M. (2000). Using Hooke's law to explore linear functions. *The Mathematics Teacher, 93*(5), 391-398. **[I]**

McGuire, T. (1993). The Gaia nineties. *The Science Teacher, 60*(6), 31-35. **[I]**

Mcintosh, K. (1993). Animals that aren't cuddly. *Science Scope, 16*(6), 42-44. **[I]**

McMahon, M. M., O'Hara, S. P., Holliday, W. G., McCormack, B. B., & Gibson, E. M. (2000). Curriculum with a common thread. *Science and Children, 37*(7), 30-35, 57. **[C-I]**

Mecca, P. M. (1991). *Mathematics-science integration project: A collaborative, rural school effort.* Paper presented at the annual meeting of the National Association for Research in Science Teaching, Lake Geneva, WI. (ERIC Document Reproduction Service No. ED342623) **[R]**

Meier, S. L., Cobbs, G., & Nicol, M. (1998). Potential benefits and barriers to integration. *School Science and Mathematics, 98*(8), 438-445. **[R]**

Meier, S. L., Hovde, R. L., & Meier, R. L. (1996). Problem solving: Teachers' perceptions, content area models, and interdisciplinary connections. *School Science and Mathematics, 96*(5), 230-237. **[C]**

Meltzer, D. E., & Espinoza, A. M. (1997). Guided inquiry: Let students discover the laws of physics for themselves. *Science Scope, 21*(2), 28-31. **[I]**

Merrill, C. (2001). Integrated technology, mathematics, and science education: A quasi-experiment. *Journal of Industrial Teacher Education, 38*(3), 45-61. **[R]**

Methany, D. (2001). Consumer investigations: What is the "best" chip? *Teaching Children Mathematics, 7*(7), 418-420. **[I]**

Miller, K. W., & Davison, D. (1998). Is thematic integration the best way to reform science and mathematics education? *Science Educator, 7*(1), 7-12. **[R]**

Miller, K. W., & Davison, D. M. (1999). Paradigms and praxis: The role of science and mathematics integration. *Science Educator, 8*(1), 25-29. **[R]**

Miller, K. W., & Davison, D. M. (2001). A cultural and linguistic approach to teaching science and mathematics to Native American students. *Science Educator, 10*(1), 38-42. **[I]**

Miller, K., Metheny, D., & Davison, D. (1997). Issues in integrating mathematics and science. *Science Educator, 6*(1), 16-21. **[C]**

Miller, L. D. (1992). Preparing elementary mathematics-science teaching specialists. *The Arithmetic Teacher, 40*(4), 228-231. **[R]**

Miller, L. M., & Castellanos, J. (1996). Use of technology for science and mathematics collaborative learning. *School Science and Mathematics, 96*(2), 58-62. **[C-I]**

Miller, R. (1995, March). A physics/analysis class. *Ohio Journal of School Mathematics, 30*, 1-4. **[C]**

Milojevic, S., & Clemons, P. (1993). What's working in education: Trip to pumpkin farm injects reality into math and science. *Curriculum Review*, 33(1), 12. **[I]**

Mitchell, C. E., Miller L. D., & Paine, G. (1995). Scientific methodology and elementary school mathematics. *School Science and Mathematics, 95*(5), 260-263. **[I]**

Monhardt, R., & Henriques, L. (1997). Interdisciplinary learning: Adding an egg to the mix. *Science Activities, 34*(1), 22-28. **[I]**

Moore, T. (1995). Physics with shampoo bottle cars. *The Technology Teacher, 54*(7), 9-10. **[I]**

Morita, J. G. (1999). Capture and recapture: Your students' interest in statistics. *Mathematics Teaching in the Middle School, 4*(6), 412-418. **[I]**

Moss, R. (1996). A multimedia computer program to teach statistics in genetics: Walking through the chi-square test. *Journal of College Science Teaching, 25*(4), 270-273. **[I]**

Mudroch, V. (1992). The future of interdisciplinarity: The case of Swiss universities. *Studies in Higher Education, 17*(1), 43-54. **[C]**

Murphey, A. (1994). Potpourri: Are all medium colas the same size? *Science Scope, 17*(5), 25. **[I]**

Nelson, J. R., & Frederick, L. (1994). Can children design curriculum? *Educational Leadership, 51*(5), 71-74. **[C]**

Nelson, V., & Stanko, A. (1992). Math safari. *Learning, 21*(1), 43-51. **[I]**

Newburgh, R. (1996). Real, imaginary, and complex numbers: Where does the physics hide? *The Physics Teacher, 34*(1), 23-25. **[I]**

Nickel, J. A. (1994). Equations. *The Science Teacher, 61*(6), 38-41. **[I]**

Nicol, M. P. (1997). How one physics teacher changed his algebraic thinking. *The Mathematics Teacher, 90*(2), 86-89. **[R]**

Niess, M. L. (2001). A model for integrating technology in preservice science and mathematics content-specific teacher preparation. *School Science and Mathematics, 101*(2), 102-109. **[R]**

Nord, G. D., & Nord, J. (1995). An example of algebra in Lake Roosevelt. *The Mathematics Teacher, 88*(2), 116-120. **[I]**

Nord, G. D., & Nord, J. (1998). Sediment in Lake Coeur d'Alene, Idaho. *The Mathematics Teacher, 91*(4), 292-296. **[I]**

Nye, B. A., & Thigpin, C. G. (1993). Examining the relationship between process-oriented staff development and classroom practices using integrated mathematics and science instructional modules. *Journal of Elementary Science Education, 5*(1), 10-26. **[R]**

Oakes, J. M. (1997). Discovery through graphing. *The Science Teacher, 64*(1), 33-35. **[I]**

O'Brien, M., & Chalif, D. (1991). *CHEMATH: A learning community in science and math.* Lynnwood, WA: Edmonds Community College. (ERIC Document Reproduction Service No. ED336157) **[C-I]**

O'Brien, T., & Seager, D. (2000). 5 E(z) steps to teaching Earth-Moon scaling: An interdisciplinary mathematics/science/technology mini-unit. *School Science and Mathematics, 100*(7), 390-395. **[I]**

O'Brien, T., Stannard, C., & Telesca, A. (1994). A baker's dozen of discrepantly dense demos. *Science Scope, 18*(2), 35-38. **[I]**

Ollendyke, C. K. (1993). Space day. *Science Scope, 16*(6), 40-41. **[I]**

Onwu, G. O. M. (1993). Line graphing ability of some Nigerian secondary science students. *International Journal of Mathematical Education in Science and Technology, 24*(3), 385-390. **[R]**

Ostlund, K. (1993). Creating a culture. *Science Scope, 16*(6), 20-24. **[I]**

Oty, K. J., Elliott, B. M., & McArthur, J. M. (2000). An interdisciplinary algebra/science course. *Primus, 10*(1), 29-41. **[C]**

Pacyga, R. (1994). Implementing the curriculum and evaluation standards: Making connections by using molecular models in geometry. *The Mathematics Teacher, 87*(1), 43-47. **[I]**

Palmer, J. M. (1991). Planning wheels turn curriculum around. *Educational Leadership, 49*(2), 57-60. **[C]**

Pang, J., & Good, R. (2000). A review of the integration of science and mathematics: Implications for further research. *School Science and Mathematics, 100*(2), 73-82. **[R]**

Papay, K., Serum, L., & Donnelly, J. (1996). Predicting the orbits of satellites with a TI-85 calculator. *The Science Teacher, 63*(4), 33. **[I]**

Passarello, L. M., & Fennel, F. (1992). IDEAS. How big is your heart? *The Arithmetic Teacher, 39*(6), 32-39. **[I]**

Patterson, J. (2000). Physical principles versus mathematical rigor. *The Physics Teacher, 38*(4), 214. **[I]**

Pautz, R. (1993). Construct a colorimeter. *The Science Teacher, 60*(7), 42-44. **[I]**

Pearlman, S., & Pericak-Spector, K. (1993). SSMILes. Mealworm math. *School Science and Mathematics, 93*(6), 332-337. **[I]**

Pearlman, S., & Pericak-Spector, K. (1994). A series of seriation activities. *Science and Children, 31*(4), 37-39. **[I]**

Pearlman, S., & Pericak-Spector, K. (1995a). SSMILes. Chocolate chip cookies: A consumer unit. Part I: Using statistics. *School Science and Mathematics, 95*(3), 154-159. **[I]**

Pearlman, S., & Pericak-Spector, K. (1995b). SSMILes. Chocolate chip cookies: A consumer unit. Part II: Investigating snacks. *School Science and Mathematics, 95*(4), 209-216. **[I]**

Petrie, H. G. (1992). Interdisciplinary education: Are we faced with insurmountable opportunities? In G. Grant (Ed.), *Review of research in education*. Washington, DC: American Educational Research Association. **[C]**

BEST COPY AVAILABLE

Piazza, J. A., Scott, M. M., & Carver, E. C. (1994). Thematic webbing and the curriculum standards in the primary grades. *The Arithmetic Teacher, 41*(6), 294-298. **[C-I]**

Pleacher, M. (1998). The science and math connection. *The Science Teacher, 65*(2), 48-51. **[I]**

Poelker, B. (1993). Eratosthenes updated. *Science Scope, 16*(6), 18-19. **[I]**

Preece, J., & Janvier, C. (1992). A study of the interpretation of trends in multiple curve graphs of ecological situations. *School Science and Mathematics, 92*(6), 299-306. **[R]**

Preston, V. (1991). *Mathematics and science curricula in elementary and secondary education for American Indian and Alaska native students*. Washington DC: Department of Education, Indian Nations at Risk Task Force. (ERIC Document Reproduction Service No. ED343767) **[C]**

Rakow, S. J., & Vasquez, J. (1998). Integrated instruction: A trio of strategies. *Science and Children, 35*(6), 18-22. **[R]**

Redmond, A. (1993). Exploring mars. *Science Scope, 16*(6), 36-39. **[I]**

Rice, P. R., Poth, J., Griffing, D. F., Kelly, D. C., Marcum, S. D., & Priest, J. (1994). X-days for the calculus-based introductory course. *The Physics Teacher, 32*(3), 178-181. **[C]**

Richardson, D. (1997). Mapping Venus: Modeling the Magellan mission. *The Science Teacher, 64*(8), 22-24. **[I]**

Riddle, B. (1994a). Making time. *Science Scope, 18*(1), 72-74. **[I]**

Riddle, B. (1994b). Scope on the skies: The sunscape. *Science Scope, 18*(2), 52-53. **[I]**

Roebuck, K. I., & Warden, M. A. (1998). Searching for the center on the mathematics-science continuum. *School Science and Mathematics, 98*(6), 328-333. **[I]**

Ronau, R. N., & Karp, K. S. (2001). Power over trash: Integrating mathematics, science, and children's literature. *Mathematics Teaching in the Middle School, 7*(1), 26-31. **[I]**

Ross, J. A., & Hogaboam-Gray, A. (1998). Integrating mathematics, science, and technology: Effects on students. *International Journal of Science Education, 20*(9), 1119-1135. **[R]**

Roth, W. M. (1991). The development of reasoning on the balance beam. *Journal of Research in Science Teaching, 28*(7), 631-645. **[R]**

Roth, W. M. (1992). Bridging the gap between school and real life: Toward an integration of science, mathematics, and technology in the context of authentic practice. *School Science and Mathematics, 92*(6), 307-317. **[R]**

Roth, W. M. (1993). Problem-centered learning for the integration of mathematics and science in a constructivist laboratory: A case study. *School Science and Mathematics, 93*(3), 113-122. **[R]**

Roth, W. M., & Bowen, G. M. (1994). Mathematization of experience in a grade 8 open inquiry environment: An introduction to the representational practice of science. *Journal of Research in Science Teaching, 31*(3), 293-318. **[R]**

Rouncefield, M. (1993). Pendulums go non-parametric! *Mathematics in School, 22*(1), 6-7. **[I]**

Rubink, W. L., & Taubee, S. R. (1999). Mathematical connections from biology: Killer bees come to life in the classroom. *Mathematics Teaching in the Middle School, 4*(6), 350-356. **[I]**

Rubino, A. M., & Duerling, C. K. (1991). Around the world in science class. *Science and Children, 28*(7), 37-39. **[I]**

Rule, A. C. (1991). SSMILes. Super sand sifting (sieving different size fractions of sediments). *School Science and Mathematics, 91*(8), 382-385. **[I]**

Rule, A. C. (1992). SSMILes. Investigating the uses of numbers in science and everyday life. *School Science and Mathematics, 92*(3), 157-162. **[I]**

Rule, A. C. (1999). SSMILes. Descriptive adjective object boxes. *School Science and Mathematics, 99*(7), 400-408. **[I]**

Russo, R. (1997). An archaeoastronomical adventure. *The Science Teacher, 64*(2), 41-43. **[I]**

Ryan, A. (1994). Preserving integration within the national curriculum in primary schools: Approaching a school development plan. In A. Pollard & J. Bourne (Eds.), *Teaching and learning in the primary school* (pp. 194-205). New York: Routledge. **[C]**

Rybka, J. D. (1991). Factor labelling. *The Science Teacher, 58*(8), 36-37. **[I]**

Ryden, R. (1999). Astronomical math. *The Mathematics Teacher, 92*(9), 786-792. **[I]**

Rye, J. A. (1999). SSMILes. Exploring dietary kilocalories: An activity exemplifying the personal value of science and mathematics. *School Science and Mathematics, 99*(2), 94-101. **[I]**

Sacki, A., Tsukihashi, M., & Ujiie, A. (2001). A cross-curricular integrated learning experience in mathematics and physics. *Community College Journal of Research and Practice, 25*(5/6), 417-424. **[R]**

Sandefur, J. T. (1992). Drugs and pollution in the algebra class. *The Mathematics Teacher*, 85(2), 139-145. **[I]**

Sanders, M. (1993). Science and technology: A new alliance. *Science Scope, 16*(6), 56-60. **[C-I]**

Sanders, M. (1994). Technological problem-solving activities as a means of instruction: The TSM integration program. *School Science and Mathematics, 94*(1), 36-43. **[C-I]**

Sandmann, A. L., Weber, W. B., Jr., Czerniak, C. M., & Ahern, J. F. (1999). Coming full circuit: An integrated unit plan for intermediate and middle grade students. *Science Activities, 36*(3), 13-20. **[C-I]**

Sanny, J. (1999). Measuring the diameter of your blind spot. *The Physics Teacher, 37*(6), 348-349. **[I]**

Sawicki, M. (1996). Using the solar eclipse to estimate Earth's distance from the Moon. *The Physics Teacher, 34*(4), 232-233. **[I]**

Scarborough, J. D. (1993a). Integrated models for teachers. *The Technology Teacher, 52*(5), 26-30. **[R]**

Scarborough, J. D. (1993b). PHYS-MA-TECH: Operating strategies, barriers, and attitudes. *The Technology Teacher, 52*(6), 35-38. **[C-I]**

Scarborough, J. D., & White, C. (1994). PHYS-MA-TECH: An integrated partnership. *Journal of Technology Education, 5*(2), 31-39. **[C-I]**

Schlenker, R. M., & Schlenker, K. R. (2000). Integrating science, mathematics, and sociology in an inquiry-based study of changing population density. *Science Activities, 36*(4), 16-19. **[I]**

Schmidt, D. (2000). After the bell: Adopting and observing. *Science Scope, 24*(3), 10-14. **[I]**

Schmidt, M. F., Jr. (1995). Teaching physics concepts and numbers. *The Physics Teacher, 33*(9), 584-585. **[I]**

Schmidt, S. M., & Palmer, C. (2000). Rock cycle. *The Science Teacher, 67*(8), 34-37. **[I]**

Sconyers, J., & Trautwein, C. (2000). Putting a spring in Archimedes' step. *Science Scope, 23*(5), 14-16. **[I]**

Secosky, J. J. (1995). A junket to Jupiter. *The Science Teacher, 62*(8), 24-26. **[I]**

Seidel, J. D. (1998). Symmetry in season. *Teaching Children Mathematics, 4*(5), 244-249. **[I]**

Selby, C. C. (1993). Outcomes-based education. *The Science Teacher, 60*(7), 48-51. **[C]**

Shams, M., & Boteler, T. (1993). Jurassic Park: Adventure in learning. *Science Scope, 17*(1), 12-17. **[I]**

Shannon, B. K. J. (1995). Our diets may be killing us. *Mathematics Teaching in the Middle School, 1*(5), 376-382. **[I]**

Sherman, H. J., & James, M. (1994). Quantitatively speaking. *Science Scope, 18*(3), 31-33. **[I]**

Sickle, M. V., & Dickman, C. (1996). Science across the disciplines. *Science Scope, 20*(3), 22-24. **[I]**

Sinn, J., Walthour, S., & Haren, D. (1993). Technology based mathematics and science applications: One approach. *The Technology Teacher, 53*(1), 29-35. **[C-E]**

Sinn, J., Walthour, S., & Haren, D. (1995). Technology-based math and science applications. *The Technology Teacher, 55*(2), 16-24. **[C-E]**

Slater, T. F., Coltharp, H., & Scott, S. A. (1998). A telecommunications project to empower Kansas elementary/middle level teachers as change agents for integrated science and mathematics education. *School Science and Mathematics, 98*(2), 61-66. **[R]**

Smith, D. L., & Freeman, C. C. (1997). *Active and engaged? Lessons from an interdisciplinary and collaborative college mathematics and science course for preservice teachers.* Paper presented at the American Educational Research Association, Chicago. (ERIC Document Reproduction Service No. ED411210) **[R]**

Smith, E. E., & Westhoff, G. M. (1992). The Taliesin project: Multidisciplinary education and multimedia. *Educational Technology, 32*(1), 15-23. **[C-I]**

Smith, H. (1997). How not to integrate mathematics. *Australian Primary Mathematics Classroom, 2*(3), 11-13. **[I]**

BEST COPY AVAILABLE

Smith, J. P., III. (1999). Preparing students for modern work: Lessons from automobile manufacturing. *The Mathematics Teacher, 92*(3), 254-258. **[I]**

Snyder, J. (1999). The oak leaf: Connecting geometry and biology. *The Mathematics Teacher, 92*(4), 294-298. **[I]**

Songer, N. B., & Linn, M. C. (1991). How do students' views of science influence knowledge integration? *Journal of Research in Science Teaching, 28*(9), 761-784. **[R]**

Southwell, C. (1994). Mathematics in context. *Mathematics in School, 23*(1), 12-14. **[C]**

Spence, B. S. (1996). The arcs of archaeology. *Mathematics Teaching in the Middle School, 1*(9), 688-693. **[I]**

Stalling, M., & Ottinger, T. (1994). Lessons for a landfill. *The Science Teacher, 61*(9), 20-25. **[I]**

Stallings, L., & Wimpey, K. (2000). Blowing bubbles: An interdisciplinary science and mathematics lab. *Science Scope, 23*(5), 24-27. **[I]**

Stavy, R., & Tirosh, D. (1992). Overgeneralization in mathematics and science: The effect of external similarity. *International Journal of Mathematical Education in Science and Technology, 23*(2), 239-248. **[R]**

Stearns, C., & Courtney, R. (2000). Content standard D: Designing assessments with the standards. *Science and Children, 37*(4), 51-55. **[I]**

Stevenson, C., & Carr, J. F. (Eds.). (1993). *Integrated studies in the middle grades: Dancing through walls*. New York: Teachers College Press. **[C]**

Stockdale, D. L. (1997). Portable planetarium. *The Science Teacher, 64*(7), 42-45. **[I]**

Stor, M., & Briggs, W. L. (1998). Dice and disease in the classroom. *The Mathematics Teacher, 91*(6), 464-468. **[I]**

Stuessy, C. L. (1993). Concept to application: Development of an integrated mathematics/science methods course for preservice elementary teachers. *School Science and Mathematics, 93*(2), 55-62. **[R]**

Stuessy, C. L. (1994). A model for preservice teacher preparation that integrates the teaching and learning of mathematics and science. *School Science and Mathematics, 94*(1), 30-31. **[C]**

Stuessy, C. L., & Naizer, G. L. (1996). Reflection and problem solving: Integrating methods of teaching mathematics and science. *School Science and Mathematics, 96*(4), 170-177. **[R]**

Stump, S. L. (2000). Doing mathematics with bicycle gear ratios. *The Mathematics Teacher, 93*(9), 762-768, 775-776. **[I]**

Sumrall, W. J., & Forslev, A. W. (1994). Spreadsheet meteorology. *Science Scope, 18*(1), 36-38. **[I]**

Sumrall, W. J., & Halpin, R. F. (2000). Integration and presentation. *Science and Scope, 24*(1), 68-71. **[I]**

Swift, R. L., & Crites, T. (1995). Integrating science and mathematics: Number of vents and rate of flow. *School Science and Mathematics, 95*(7), 359-364. **[I]**

Tappin, L. (1994). Analyzing data relating to the Challenger disaster. *The Mathematics Teacher, 87*(6), 423-426. **[I]**

Taylor, J. A. (2001). Using a practical context to encourage conceptual change: An instructional sequence in bicycle science. *School Science and Mathematics, 101*(3), 117-124. **[R]**

Taylor, M. D. (1991). Sharing teaching ideas: Student participation: An experiment in teaching calculus. *The Mathematics Teacher, 84*(7), 543-546. **[R]**

Teachworth, M. (1994). Build a bed of nails. *The Science Teacher, 61*(6), 54-56. **[I]**

Texley, J. (2001). Adding math to biology. *The Science Teacher, 68*(4), 36-39. **[I]**

Theriault, R. (1994). Firing range physics. *The Science Teacher, 61*(2), 18-20. **[I]**

Thomas, D. A., Johnson, K., & Stevenson, S. (1996). Integrated mathematics, science, and technology: An introduction to scientific visualization. *Journal of Computers in Mathematics and Science Teaching, 15*(3), 267-294. **[C-I]**

Thompson, K. W., & Harrell, M. E. (1997). Geometry and Moon phases. *Science Scope, 21*(2), 35-37. **[I]**

Thomson, B. S., & Hartog, M. D. (1993). *Activities to teach mathematics in the context of environmental studies*. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education. (ERIC Document Reproduction Service No. ED359052) **[I]**

Thornton, C. A., Damkoehler, D. D., Gehrenbeck, H., & Jones, G. A. (1995). The children's rain forest. *Teaching Children Mathematics, 2*(3), 144-148. **[I]**

Tippins, D. J., & Pate, P. E. (1991). Lifestyles in life science. *Science Scope, 15*(3), 39-42. **[I]**

Tirosh D., & Stavy, R. (1992). Students' ability to confine their application of knowledge: The case of mathematics and science. *School Science and Mathematics, 92*(7), 353-358. **[R]**

Tometsko, N. R., & Bhattacharya, D. N. (1991). Sharing teaching ideas: Earthquakes and black coffee. *The Mathematics Teacher, 84*(7), 541-542. **[I]**

Tretter, T. R. (2000). Physical science lab essentials. *The Science Teacher, 67*(7), 48-52. **[I]**

Trezise, K. (1995). Investigations. Food for thought. *Teaching Children Mathematics, 2*(3), 170-174. **[I]**

Trezise, K. A. (1998). Mathematics fitness. *Mathematics Teaching in the Middle School, 3*(7), 458-462. **[I]**

Turkall, S. F. (1996). Student-designed river study. *Science Scope, 19*(7), 22-25. **[I]**

Tyler-Wood, T. L., Mortenson, M., & Dawn, P. L. (2000). An effective mathematics and science curriculum option for secondary gifted education. *Roeper Review, 22*(4), 266-269. **[R]**

Underhill, R. G. (1994). Editorial: What is integrated mathematics and science? *School Science and Mathematics, 94*(1), 1. **[R]**

Underhill, R. G. (1995a). Editorial: Integrate or connect? Changing tactics. *School Science and Mathematics, 95*(1), 337. **[R]**

Underhill, R. G. (1995b). Editorial: Observations about the scope of 1995 articles. *School Science and Mathematics, 95*(8), 393. **[R]**

Underhill, R. G. (1995c). Integrating math and science: We need dialogue! *School Science and Mathematics, 95*(5), 225. **[R]**

Underhill, R. G., Abdi, W. S., & Peters, F. P. (1994). The Virginia State Systemic Initiative: A brief overview of the lead teacher component and a description of the evolving mathematics & science integration outcomes. *School Science and Mathematics, 94*(1), 26-29. **[C]**

Vacher, H. L., & Mylroie, J. E. (2001). Connection with geology: Where's the end of the cave? *The Mathematics Teacher, 94*(8), 640-646. **[I]**

Van Dyke, F. (1994). Relating to graphs in introductory algebra. *The Mathematics Teacher, 87*(6), 427-437, 438. **[I]**

Van Dyke, F. (1996). The inverse of a function. *The Mathematics Teacher, 89*(2), 121-126, 132-133. **[I]**

Van Haneghan, J., Barron, L., Young, M., Williams, S., Vye, N., & Bransford, J. (1992). The Jasper Series: An experiment with new ways to enhance mathematical thinking. In D. F. Halpern (Ed.), *Enhancing thinking skills in the sciences and mathematics* (pp. 15-38). Hillsdale, NJ: Erlbaum. **[C]**

VanLeuvan, P. (1997). Young women experience mathematics at work in the health professions. *Mathematics Teaching in the Middle School, 3*(3), 198-206. **[C-I]**

Venville, G., Wallace, J., Rennie, L. J., & Malone, J. (1998). The integration of science, mathematics, and technology in a discipline-based culture. *School Science and Mathematics, 98*(6), 294-302. **[R]**

Wagner, J. R. (2000). Sneaking mathematical concepts through the back door of the introductory geology classroom. *Mathematical Geology, 32*(2), 217-229. **[C]**

Wagner-Pine, L., & Keith, D. G. (1994). SSMILes. Investigating various volcanic eruptions and volcano heights. *School Science and Mathematics, 94*(8), 432-438. **[I]**

Walker, N. (1993). Weather data and statistical techniques. *School Science and Mathematics, 93*(4), 188-190. **[I]**

Wandersee, J. H. (1992). Exploring human growth: Using a calculator to integrate mathematics and science. *School Science and Mathematics, 92*(2), 96-98. **[I]**

Watanabe, T., & Huntley, M. A. (1998). Connecting mathematics and science in undergraduate teacher education programs: Faculty voices from the Maryland collaborative for teacher preparation. *School Science and Mathematics, 98*(1), 19-25. **[R]**

Weber, R. (1994). Star-dome in the making. *Science Scope, 18*(1), 25-27. **[I]**

Welch, L. A. (1993). A model of microevolution in action. *The American Biology Teacher, 55*(6), 362-365. **[I]**

Wesbrook, S. L. (1998). Examining the conceptual organization of students in an integrated algebra and physical science class. *School Science and Mathematics, 98*(2), 84-92. **[R]**

Westerberg, J., & Whiting, J. (1992). Popcorn: An explosive mixture of general mathematics and general science. *The Mathematics Teacher, 85*(4), 306-308. **[I]**

Wetzel, D. R. (2000). Fan car physics. *Science Scope, 23*(4), 29-31. **[I]**

Whitmer, J. C. (1992). SSMILes. Thinking small: Milligrams, micrograms and counting atoms. *School Science and Mathematics, 92*(1), 40-44. **[I]**

Wicklein, R. C., & Schell, J. W. (1995). Case studies of multidisciplinary approaches to integrating mathematics, science and technology education. *Journal of Technology Education, 6*(2), 59-76. **[R]**

Wiest, L., & Quinn, R. (2000). Colourful probabilities: An integrated maths-science lesson. *Australian Primary Mathematics Classroom, 5(*2), 19-23. **[I]**

Wiley, D. A., & Royce, C. A. (2000). Crash into meteorite learning. *Science and Children, 37*(8), 16-19. **[I]**

Wilson, D. A. (1995). Home energy survey. *The Science Teacher, 62*(8), 32-35. **[I]**

Woolnough, J. (2000). How do students learn to apply their mathematical knowledge to interpret graphs in physics? *Research in Science Education, 30*(3), 259-267. **[R]**

Worden, G. P., Murphy, B. G., & Stevens, D. (1994). Bungee basics. *The Science Teacher, 61*(7), 50-53. **[I]**

Yamamoto, T. (1998). *A comparison of the quality of integrated freshman-year curriculum for science, engineering and mathematics with a conventional curriculum.* Terre Haute, IN: Indiana State University. (ERIC Document Reproduction Service No. ED436359) **[R]**

Young, P. G. (1998). Probability, matrices, and bugs in trees. *The Mathematics Teacher, 91*(5), 402-406, 412-415. **[I]**

Zuga, K. F. (2000). Technology education as an integrator of science and mathematics. In G. E. Martin (Ed.), *Education for the 21st century a collection of essays* (pp. 223-227). Peoria, IL: Glencoe/McGraw-Hill. **[R]**

APPENDIX

LISTING OF JOURNALS IN THE BIBLIOGRAPHY

American Journal of Education
American Journal of Physics
Australian Primary Mathematics Classroom
British Journal of Educational Technology
Community College Journal of Research and Practice
Curriculum Review
Education
Educational Leadership
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